

BEST FOR SOFTWARE EVERY WEEK

Home

An Argus Specialist Publication

Computing WEEKLY

September 13-19, 1983

No. 28

38p

FREE: A&F software worth £1,000 must be won

Great games to type in for Spectrum and TI-99/4A

Software reviews for: TI-99/4A, Spectrum, BBC, Atari, Oric, Commodore 64, Dragon

Programming advice for VIC-20, Commodore 64 and Oric



Share in Sinclair next year

Sinclair Research has chalked up £14m profit — and you could soon be in line for a share. The company, makers of the highly successful Spectrum and ZX81 computers, doubled its turnover in the year ended in March to £55.53. It means that earnings per share — bought at £34 each by big investors like pension funds earlier this year — are £2.07 against £1.06 the previous year. Sinclair spokesman Bill

Christmas brings lots of software

Software is beginning to flood into the shops ready for what is being predicted as the biggest ever Christmas for home computing. Artic Computing has just announced no less than 21 new titles, due out in a week. And newcomer Virgin Games has brought out its second batch of eight games. Artic's managing director, Richard Turner, believes it is going to be the biggest Christmas for computing since he set up the company three years ago. He said the 21 new programs — bringing the range up to 62 — were his largest launch so far and

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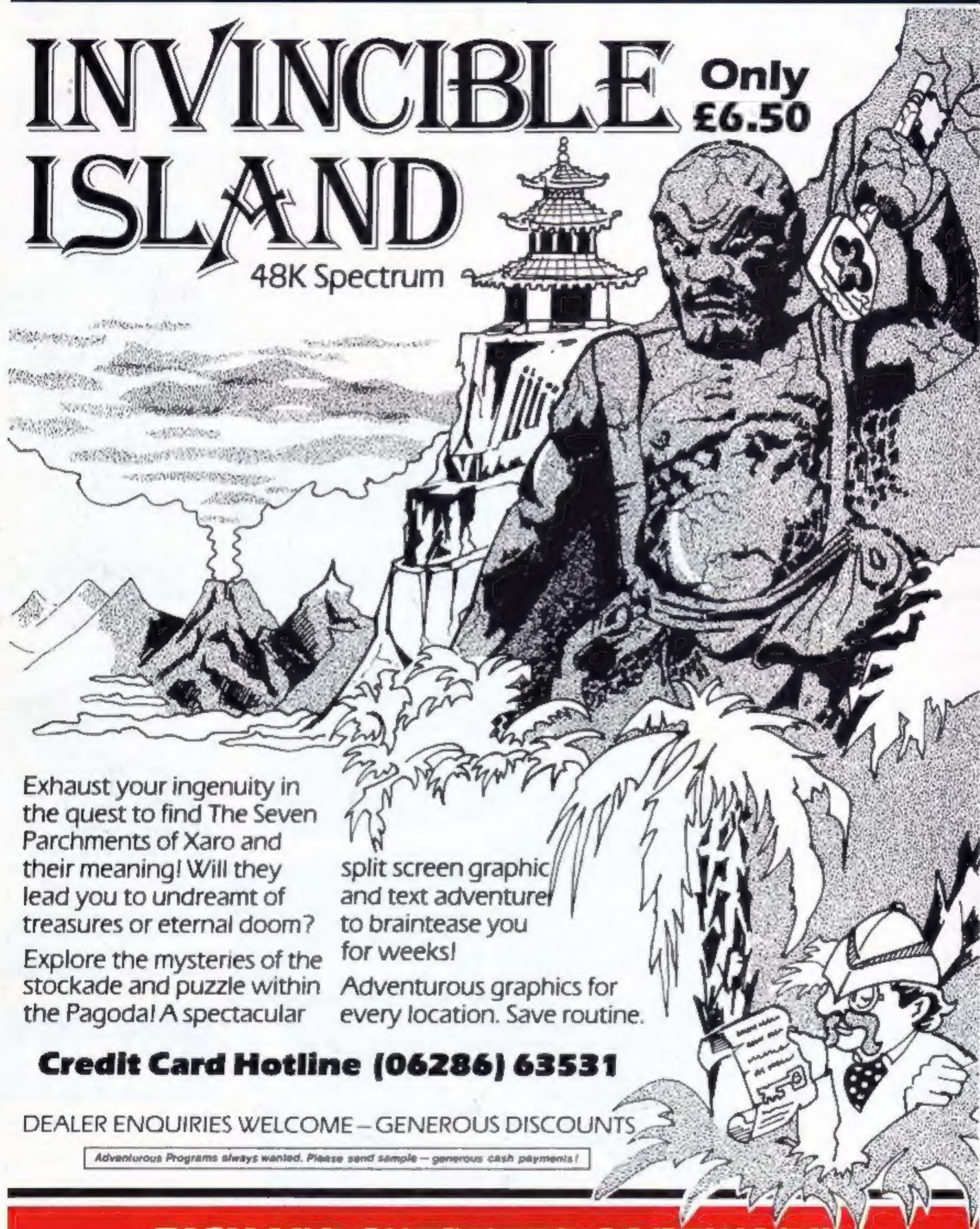
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Continued from front page

were the result of a successful appeal to freelance programmers.

Mostly priced at £5.95, there are five for the VIC-20, one for the Oric, 10 for the Spectrum and five for the ZX81.

Artic has also become the distributor for educational software from Arnold Wheaton. There are six titles for the Spectrum and BBC micros costing £13.95 each.

Virgin's new titles, priced at £5.95 and £6.95, are two each for the Spectrum and the VIC-20, three for the Dragon and one for the Oric.

And the company has bought a double decker bus to promote its products. Fitted out with 12 computers and carrying programmers to answer queries, it will tour the country from October to Christmas.

Buyers of the new games are also entered in a draw for six prizes of days out, plus posters and T-shirts.

Artic Computing, Main Street, Brandesburton, Diffield YO25 8RG

Virgin Games, 61/63 Portobello Road, London W11 3DD



**Copy that
screen — in
colour**

Good news for Spectrum owners — now you can use the Tandy CGP-115 four colour printer plotter to make screen copies.

Some months ago, Softest brought out an interface which linked the CGP-115 computers. The CGP-115 is a plain paper printer which uses four coloured pens to produce text in a wide range of sizes. It can also be used to plot at 52 mm per second horizontally and 73 mm per second vertically.

The only drawback was that the printer couldn't be used for producing screen dumps. Now it will, thanks to a new screen copy program developed by Softest for the Spectrum.

The program costs £5, and the interface costs £35.

Softest, 10 Richmond Lane, Romsey, Hants SO5 8LA

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"The text is liberally supported by all manner of useful diagrams and illustrations (including many black and white photographs of the screen). The overall presentation is excellent. The printing, setting out and listings are clear and positively invite the reader to have a go."

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SPECTRUM 16K (usable on 48K)

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Parallel Printer Interfaces:

■ **The Standard Interface:** Centronics interface to link your ZX Spectrum to many popular dot matrix and daisywheel printers. The package includes: interface, simple word processor, 3 sets (different) of printer software, cable, centronics plug, full instructions. The **LLIST** and **LPRINT** commands are supported. Many other features also. £45 inc. VAT. Post free. ■ **The Deluxe Interface:** Includes all the features of the standard package, and also has a 3.5 mm jack socket and special circuitry which allows the ZX Spectrum to **Save and Load**, without having to unplug or switch anything. £55 inc. VAT. Post Free. ■ **The Professional Interface:** Includes all the features of the deluxe package, but also allows the ZX Spectrum to be used as a very powerful peripheral processor for a bigger computer! Software is supplied which post-processes word processor output with straight right and left margins. £99 inc. VAT. Post Free.

Tape Loading Problems With Your Computer?

■ **Loading Aid:** Allows you to get tape playback level right first time. Helps with dropouts and to check tape quality too! Standard model £5.95, De luxe model £7.95 ■ **The Microcomputer User's Book of Tape Recording:** Is a practical guide to help you get programs in and out of your computer. Written for the computer user - but several audio and computer professionals have found it useful! ISBN 0 946476 00 4. ONLY £3.15 incl. postage (£2.90 in shops - temporarily out of stock) ■ **Test and Alignment Cassette:** Tape loading problems are often due to a mis-aligned tape head. Align your tape head by ear with our tape - no instruments required! £4.90

ZX81 16K

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Continued from front page

Nichols said a dividend of 1p per share was being recommended to the annual meeting.

The bulk of the profits would be re-invested in the company. This includes the money which Sir Clive Sinclair could claim as the owner of most of the Sinclair shares.

Last year's profit was £8.55m and trading this year is so far "looking very good".

City observers have been contrasting Sinclair's figures with the news of serious cash troubles which have hit Dragon and Grundy, makers of the NewBrain micro.

However, it has been pointed out that the Sinclair figures are dated March 31 — before the round of price-cutting in the UK and, more fiercely, in America.

Although U.S. versions of the Spectrum and ZX81 are now on sale in America, Sinclair is shielded from the price war there because Timex, selling them under licence, pays a royalty.

Sinclair expects less than was anticipated.

Next year the company plans to make shares more widely available. Present shareholders bought them through a private placing by a merchant bank.

A public offer of more shares would be made either on the Unlisted Securities or a full launch on the Stock Exchange.

£2½m more to help the Dragon

Banks and shareholders have put another £2½m into Dragon Data to ease the company's cash crisis.

The problem was brought on by the summer sales drop, said marketing director Richard Wadman. However, he said, Dragon had held its market share at No. 2 in sales and expected to beat its sales of 32,000 in the September-December period compared with the same months last year.

By the end of this month a 64K model would be on sale. As reported in HCW, an American company is to sell the Dragon in the U.S. And the prospects for Europe looked healthy with distributors being signed.

Dragon Data, based in West Glamorgan, is 42 per cent owned by Prutech — the new technology financing arm of the Prudential insurance company — 23 per cent by the Welsh Development Agency, 15.5 per cent by Mettoy and 8.6 per cent by the National Water Council.

In an earlier financial problem, Mettoy sold most of its interest to Prutech.

A new chief executive is expected to be appointed soon from GEC. At present the acting chief executive is Derek Morgan, vice-chairman, who is with PA Management Consultants whose research centre designed the Dragon.

● Dragon's disc drive has just been launched at £275. It has a claimed storage of 184K on a single-sided double density 5¼" disc. Another half-height drive can also fit into the steel case and two double units can be linked.

Dragon Data, Kenfig Industrial Estate, Margam, Port Talbot, West Glamorgan

Wordsworth on disc

The Wordsworth word processing package for the BBC, which has been out for several months on cassette, has now make its disc debut.

Author Ian Copestake reckons that it has several advantages — apart from the most obvious one of price — over its ROM-based rivals.

Unlike Wordwise, you can make multiple copies (500, in fact) of your document — whether it's an address label or a letter. And unlike VIEW, you don't have to save the document before you can print it out.

Probably the biggest drawback is that it uses up more of the computer's memory, and the disc version takes up more room than the tape. You can store about two A4 pages in internal memory after the program has been loaded.

On the other hand, with the rapid access of a disc drive, lack of internal storage space probably won't bother you too much.

The disc Wordsworth costs £19.50, as opposed to £17.25 for the tape.

Ian Copestake, 23 Connaught Crescent, Brookwood, Woking, Surrey GU24 0AN.

96K Lynx on the prowl

Now 96K Lynxes are beginning to prowl the high streets with Laskys selling the computer at 50 of its Micropoint stores.

And three large distributors will soon be offering it too.

The 96K model costs £299 and owners of the 48K version can return them to dealers for an upgrade costing £89.95.

Computers, 33A Bridge Street, Cambridge CB2 1UW

New way to link up a printer

If you want to link a Centronics-type printer to a Spectrum or a ZX printer to a Jupiter Ace or BBC Micro, Advanced Digital Systems has the interface to let you do it.

Its Centronics interface can be used to produce plain-paper printouts direct from BASIC. Not only will it work with the Spectrum, but a change of software lets it link up to the ZX81. The further addition of a £5 adapter card converts it to work with the Jupiter Ace. The interface itself costs £34.50.

A package including the same adapter card and software enables the ZX printer to be linked to the Ace. There are two versions of the software — one will run on the unexpanded Ace, but will not deal with graphics or user defined characters. The second version, for the expanded Ace, will tackle all characters. The whole package costs £9.95.

Another kit of adapter and software will let you connect your BBC micro to the ZX Printer,

and is expected to cost around £15. Advanced Digital Systems' technical director said: "We're the first to admit that the ZX printer is not exactly word processor quality, but for listings it's ideal. Our adapter must be the cheapest entry into printing on the BBC."

Advanced Digital Systems, 9 Bonchurch Road, Portsmouth, Hants PO4 8BR

Make a studio date

Central TV is looking for young people to form the studio audience for a six-part series on computers. Recordings will be in Birmingham on the 16th and 23rd of next month and November 2 and 7. Applicants should say which date they prefer, name their micro and its use and enclose a note from parent or guardian giving consent to attend.

Write (do not phone): Geoffrey Negus, Central TV, Broad St, Birmingham B1 2JP

You could be on our pages

We welcome programs articles and tips from our readers.

PROGRAMS should, if possible, be computer printed to a width of 48 characters (use a new ribbon) and/or sent on cassette. Check carefully that they are bug-free. Include details of what your program does, how it works, variables you have used and hints on conversion.

ARTICLES on using home computers should be no longer than 2,000 words. Don't worry about your writing ability — just try to keep to the style in HCW. Articles most likely to be published will help our readers make better use of their micros by giving useful ideas, possibly with programming examples. We will convert any sketched illustrations into finished artwork.

TIPS are short articles, and brief programming routines which we can put together with others. Your hints can aid other computer users.

Competitive rates are paid.

Keep a copy of your submissions and include an SAE if you want them returned. Label everything clearly and give a daytime and home phone number if you can.

Paul Liptrot, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE

Fly through the air with the greatest of ease

As easy as switching on your micro, in fact. Here our panel says how a selection of games with aeronautical themes took off with them.

Shuttle Command TI 99/4A (Extended BASIC) £12

FFF Software, distributed by Stainless Software, 10, Alstone Road, Stockport

The astonishingly inventive use of graphics and programming in this game tends to obscure its rather nasty origin. The basis for the game is the launching by the Russians of 'thousands of unmanned, unarmed, robot satellites' with the intention, cleverly uncovered by the Americans, of literally 'bumping' off the naturally more-peaceful American satellites. What a scream?

Your mission, of course, is to destroy all the Russian hardware. As each enemy satellite approaches, it gets bigger, and the number of points for its successful plastering diminish.

If one gets too close, it causes damage to you — mean trick, that. At 100% damage, the game ends. Points scored, damage sustained, and fuel left are displayed beneath an incredible view-port display.

The movement of both stars and satellites in response to keypresses begins to rival machine code on other machines.

	P.B.
instructions	100%
playability	50%
graphics	100%
value for money	90%



Chopper Rescue 48K Spectrum £5.95

Blaby Computer Games, Crossways House, Lutterworth Road, Blaby, Leicester.

Chopper Rescue is a true arcade-style game with an unusual plot. An aircraft is flying across the top of the screen, dropping bombs and radio-active waste onto the heads of some poor scientists who gradually become entombed in the green, gungy waste.

You must fly your helicopter as your fuel ticks away and use your blaster to make shafts in the waste, to reach the scientists and carry them to the safety of the helipad.

If your chopper is hit by a

bomb or a lump of falling waste, it explodes. The explosion is multi-coloured and noisy, which is as it should be.

This is a true arcade quality game with an original plot (I believe), with excellent sound effects, well chosen colours and a high degree of skill level required.

There is a high score feature and on-screen score which change colour in true arcade style.

The only thing that I could find fault with were the instructions, which do not tell you how to pick up the scientist.

	M.B.
instructions	50%
playability	90%
graphics	95%
value for money	90%



Dogfight BBC 32K £9.95

Opus, 701 Camberwell Road, London SE5 0EE

This cassette contains the most original and entertaining program I have seen for a long time. The theme is the aerial battles of the First World War and has two planes, and players, trying to shoot each other down. You are in command of one of these acrobatic planes controlling speed, turn and gunfire.

Control is either by well-placed keys or joysticks. I preferred joysticks, but the keys are more positive and precise. With eight difficulty levels, one can play for a long period without getting bored.

You can't afford to lose concentration for a second though,

for if you crash after you have shot down your opponent you forfeit the game!

There is even a valley for real aces to fly down which allows you back to the center of the screen. The only improvement, I would suggest, is the option to play the game against the computer as I have now shot down all the local aces.

The graphics and sound effects are excellent, but the on screen instructions are beyond compare; I certainly have never seen or heard anything like them.

I recommend this program without reservation. **D.C.**

instructions	100%
playability	95%
graphics	90%
value for money	100%



Heathrow Air Traffic Control Spectrum £7.95

Hewson Consultants, 60A, St Mary's St, Wallingford, Oxon OX10 0EL

Here's a chance to take a crash course (pun intended) in Air Traffic Control with this simulation program from Hewson.

You must attempt to land eight or more aircraft safely within a time limit of 25 minutes. The planes are "stacked" in four areas to await your instructions as to direction, speed and height. Your television represents a radar screen, communication read-out and a stacking information table.

There are six levels of play as well as a demonstration section

so that you may develop your skills gradually. The program also assesses your performance on request during the game and on completion.

The higher levels provide for unidentified aircraft, equipment failure, runway closure and the "vortex" factor, which is the effect a plane's air displacement has on a following aircraft.

There is a useful "hold" option to give you a chance to consider the airborne chaos you have caused.

The instruction leaflet is necessarily lengthy to go into the many facets of the program but for the most part directions are well explained.

	D.J.
instructions	90%
playability	85%
graphics	65%
value for money	75%



Krazy Kopter Atari 16K + Joystick

English Software, 50 Newton Street, Piccadilly, Manchester M1 2EA.

Two of your top agents have escaped from enemy custody. In their frenzy to flee they have hijacked a bright green enemy truck and even now are frantically heading for safe territory.

With hostile forces in hot pursuit the escapees are doing well — until they hit a ravine crossed by three bridges. Trouble is each bridge leads to one of the other bridges. Your intrepid agents are doomed to shuttle back and forth over the ravine relentlessly pursued by their former captors. Unless you can help.

How? By flying your helicopter above the enemy cars

and terminating same with adroitly placed bombs. Allowing even one hostile car to cross a bridge completely will result in your prompt blasting and a life lost, together with a swift fall into the river at the base of the ravine. Herein lies the snag with the game.

It is difficult to achieve anything. The game is very fast, even at the lowest level. Instead of being enjoyably coaxed into Crazy Kopter's higher levels I found it hard work just to stand still.

	T.A.
instructions	75%
playability	60%
graphics	80%
value for money	80%



40 chances to win in our great



WE'VE got £1,000-worth of great A&F software waiting to be won. And this is a competition in which everyone who enters stands to gain.

It's free, easy to enter and you have got 40 chances to win £25-worth of software for Spectrum or BBC computers.

You have probably seen A&F's range of software in shops throughout the country. Now A&F has released two new tapes guaranteed to give the family hours of fun.

So we have decided to base the competition on these two new titles: **Chuckie Egg** and **Cylon Attack**.

All you have to do is make as many words as you can from the 21 letters in these two titles, without using the letters more often than they appear on the four words.

Your total number of words — including the original four — must be written in large figures on the back of your envelope. And all the words you make up must be given in the

- **Cylon Attack**, for the 32K BBC micro, puts you in the pilot's seat for a fast-moving 3D space battle, complete with stunning graphics and sound.

- **Chuckie Egg**, which runs on the 48K Spectrum, features a chubby little character who has to collect eggs by running up ladders and along platforms and using lifts. But he has to avoid the ostriches and a crazy dive-bombing duck.

The prizes

Winners with 48K Spectrums will receive a package of software worth about £25 taken from the following A&F titles:

- | | |
|---------------------|-----------------------|
| Jungle Fever | Crazy Balloons |
| Painter | Chuckie Egg |
| Frogger | |

And winners who own BBC micros with 32K of RAM will get a selection also worth about £25, from these programs:

- | | |
|----------------------------|-----------------------|
| Shrinking Professor | Frogger |
| Horror Castle | Planes |
| Bouncer | Pharaoh's Tomb |
| Painter | Cylon Attack |

And, as we promised, every entrant stands to benefit in this HCW competition. All will receive a 10 per cent discount voucher from A&F for any software ordered direct from the company. The vouchers will not be accepted in shops.

How to enter

Make as many words as you can from the letters in these four words: **Cylon Attack** **Chuckie Egg**. The letters must not appear more often than they appear in these words.

Write them in the space provided in the coupon — attaching it to a sheet of plain paper if you need more room. Fill in the rest of the coupon, including the words Spectrum or BBC, depending on which set of prizes you would like.

Your words must be given in *The Oxford Paperback Dictionary* (2nd edition, 1983).

And you must write in large figures on the back of the envelope the number of words you have made, including the original four. Copies of the coupon will not be accepted.

Entries which do not meet these conditions will not be considered.

You have got until first post on Friday September 30, 1983 to get your entry to us and the results will be published in the news columns of *Home Computing Weekly*.

You may enter as many times as you wish provided each entry is on an original coupon and in its own envelope.

The winning entries will be the first 40 drawn with the greatest number of words. They will be checked against *The Oxford Paperback Dictionary* (2nd edition, 1983).

£1,000 competition

The prizes and vouchers will arrive from A&F within 28 days of the publication of the results.

The small print

The first 40 entries opened with the greatest number of words will be the winners. They will be chosen at noon on Friday September 30, 1983.

Coupons which are not fully and legibly completed and envelopes without the number of words made on the back will not be considered.

Entries will not be accepted from employees of Argus Specialist Publications, A&F Software and Alabaster Passmore & Sons. This restriction also applies to employees' families and agents of the companies.

The results will appear in *Home Computing Weekly*. The editor's decision is final and no correspondence will be entered into.

A&F Competition Entry Coupon

Name

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..... post code

Computer

Your words

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If you need more space, attach this coupon to a sheet of plain paper. Post to: A&F Competition, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE. Closing date: first post Friday September 30, 1983.

Games



THE AMAZING ADVENTURES OF THE LAUGHING SHARK
PART ONE

WHAT A CREEPY KEEP

HO I DO LIKE TO

THE LAUGHING SHARK TORPEDOED TO THE SURFACE ONLY TO FIND HE WASN'T IN THE SUNNY PACIFIC - BUT IN THE DARK MURKY MOAT OF THE.....

BESIDE THE SEASIDE

CASTLE ADVENTURE WITH A THOUSAND DASTARDLY DEATHS - ACCOMPANIED BY THE MAD ORGANIST - PULLING OUT ALL THE STOPS.....

MOAT HOG!!

ESCAPING THE DEADLY SOUND OF MUSIC, THE LAUGHING SHARK NARROWLY AVOIDED A CRUISE LINER - IN A MOAT?!!

THIS CRUISE COULD GO WITH A BANG!

PASSING A PORTHOLE HE ESPIED NASTY DR. SINISTER PLANTING A BOMB. STOP HIM SOMEONE - OR THIS COULD TURN INTO A..... DEATH CRUISE!!

HO-RI HEXAGLAMs! A FRYING SHARK

NOT WISHING TO SUFFER THE SAME FATE AS HIS COUSIN JAWS, OUR HERO DECIDED TO CONSULT THE ORACLE OF I CHING....

WHAT ABOUT MY FUTURE?

A PART IN JAWS IV MAYBE?

THE 4000 YEAR OLD CHINESE ART OF THE HEXAGRAM - WITH ITS KEY TO FUTURE AND THE MEANING OF LIFE.

MORE FRUSTRATING ZAN ZE RUBIC CUBE

OVERFLOWING WITH NEWLY FOUND SELF-CONFIDENCE, LAUGHING BOY FELT READY TO HELP PROF. BATTY SOLVE THE PROBLEM OF **LOJIX** AND FIT THE SHAPES

50p x 10,000? 50,000? 100,000?

- INTO THE GRID. IF YOU MANAGE TO SOLVE IT, YOU COULD WIN THE LOJIX POT OF SILVER. 50p x EACH COPY SOLD.

THIS IS THE PITS!!

DIZZY FROM HAVING TO USE HIS LITTLE FISHY BRAIN OUR INTREPID 'CHUCKLES' GOT LOST AND FOUND HIMSELF IN THE DANK DEPTHS OF **KILLER CAVERNS**..

HOP ON A VIRGIN BUS

WITH ITS HORDES OF TREASURE AND DEADLY GUARDIANS... TOO MUCH, EVEN FOR A SUPER FISH, SO HE HOPPED ON A BUS.

AND WENT OFF TO SPEND A DAY AT THE RACES, HAVE A FLUTTER OR TWO, EVEN INVEST HIS WINNINGS IN BECOMING A RACING MANAGER



ALL THAT LOVELY HORSE-FLESH

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FIN

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—TO BE CONTINUED

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by Steve Webb
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DRAGON 32
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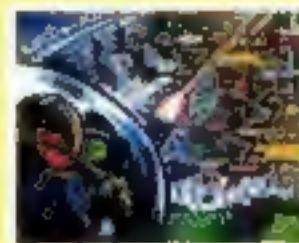
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by James Breffni
DRAGON 32
VGB 4002
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**ZX Tape Loader
ZX81 £14.99**

Elinea Products, Lyon Works, Capel Street, Sheffield, S.Yorks

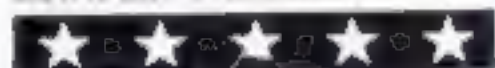
Another tape loading aid, ZX81. Measuring 119 x 99 x 40 mm, the box has a small edgewise meter set into the front, and a three position switch for Load, Off and Save. There's an LED to indicate when the switch is in the load position, which of course means that you require a battery, a PP3 in fact.

The instructions are clear and easy to follow, and on the back page are four illustrations of the screen showing various load signals.

To test the unit I used an old cassette recorder/player that I had proved was no use for com-

puting, then I found some old tapes which I had labelled as 'unloadable'. After setting up as per instructions, every tape loaded perfectly and re-saved perfectly to become quite normal tapes again.

It can be left in position all the time, which saves you the trouble of moving leads (to avoid the ear/mic loop). The battery retaining clip is not very effective, but to be fair, you wouldn't be throwing the thing about (would you?). A bit on the expensive side, perhaps. A Spectrum version is also available. **B.B.**



**Recording Level Meter
Most micros
£5.95**

Hilderbay, 8-10 Parkway, Regents Park, London NW1 7AA

For home computer enthusiasts, an essential part of the set up is a cassette recorder/player to transfer programs to and from the computer.

Unfortunately the quality of signals produced can vary tremendously from one instrument to another. This often bears no relationship to the price, and can cause difficulty when loading tapes made on machines other than your own.

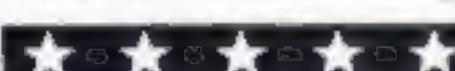
Most of the troubles appear to be the actual level of the signal

going into the computer. You can of course vary this with the volume control, but there is nothing so frustrating (to me at least) than fiddling with levels after having so carefully set the volume.

This level can be measured with an ac voltmeter, but even supposing you have one you won't want to commit it to permanent duty as a level meter.

Now Hilderbay has produced a neat meter which can be left permanently in position if so desired. It measures just 3 x 2 1/4 x 1 1/4 inches and is very easy to use.

The first time I used it I managed to load first time two tapes that has been proving very difficult. **B.B.**



**Clares Joysticks
BBC B £17.95**

Clares, 222 Townfield Road, Winsford, Cheshire CW7 4AX

In assessing hardware add-ons there are two main questions to be answered: Do they do what the makers claim? and are they worth the money? In the case of these joysticks the answer to both is a definite yes.

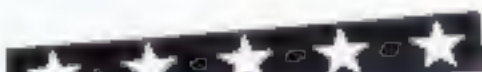
These joysticks are meant to remove the drawbacks of the manufacturers' ones and they do just that. They are small enough to fit in the hand properly without fatigue, they have a well positioned fire button and they have some 'feel'. This means that far from being just for games they are ideal for programs which can use a joystick to draw

on screen, such as Grafstick and Draftmate.

They have a square aperture, which means you can actually get maximum readings in both directions at the same time, giving them true proportionality. The D-type connector is metal, very sturdy and well fitting — unlike my present pair, which never did fit properly!

The only feature which I would like to see improved is a fire button, which does seem a little small despite its convenient placing.

Overall these joysticks are a real pleasure to use and are my firm favourites now. Even the simple drawing program on the leaflet which accompanies them is good fun. **D.C.**



**In addition
to your
micro...**

We review a selection of boxes which can complement a computer's talents

**Sound Extension Module
Dragon 32
£34.95**

JCB, 29 Southbourne Road, Bournemouth, Dorset BH6 5AE

A very well-organised package containing a cartridge and an extensive manual. The cartridge contains its own chip, and only uses about 32 bytes of memory at the top of RAM, leaving ample room for your own programs.

It generates three channels of sound thus enabling you to create chords and harmonies. There are also many predefined sound effects (eg a machine gun or car starting). All of these are accessed by a new basic command, Music, which makes the

process quite easy even for non-musicians.

There is a 3.5mm jack socket on the cartridge for connecting up to an external amplifier which, when I tried it on my old Leak system, worked a treat! A further two 8-bit input/output ports are available as an added bonus which could be used to control external devices.

The manual deals with the machine code aspects in great detail and enable you to change the notes, providing your skills in machine code programming are up to it. A further section of the manual gives you examples to type in with simple graphic routines demonstrating that the sound does not adversely affect the display.

M.P.



**Joystick Interface
48K Oric-1
£14.95**

Pasesoft, 213-215 Market Street, Hyde, Cheshire SK1 1HF

Joysticks allow an arcade style game to be played fast and furious without the keyboard being bashed about too much.

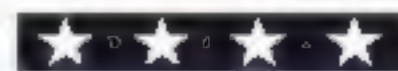
This interface allows the familiar Atari joysticks to be used with the Oric. The interface comes in the form of a small box with a connector to the printer port and sockets for one or two joysticks.

The interface comes with full instructions, including the listing and disassembly of the machine code necessary for its use. A cassette containing a demonstra-

tion game is also included. The game is a variation of Surround, and suffers greatly from the fact that it requires two players rather than one player against the computer.

There are several games around at present using the Pase interface, but not enough to warrant the price. If Oric do not bring out their own interface, however, then many more games will be brought out using this system and the price will not seem so high.

Apart from this, the system appears perfectly adequate, while the instructions should prove very useful to anyone wishing to find out more about the workings of the V.I.A. or the Oric printer port. **G.P.**



Just picture it — on your VIC

How it works:
 10-30 set up variables
 40 rearrange screen for differing memory sizes
 50 title
 148-150 background colour - option
 160-170 border colour option
 180-186 joystick or keyboard - option
 190-200 set up screen colours and menu
 210-220 main loop
 400-490 change ink colour
 500-550 read joystick
 600-650 move cursor
 654-660 change nib of pen
 660-690 print cursor
 700-780 save picture
 800-860 load picture
 900-970 read keyboard

My Artist program will allow colour pictures to be drawn on an unexpanded VIC-20, saved and loaded on tape for further use.

When first run, the program will ask for a border colour. You respond by pressing one of the colour keys at the top left of the keyboard. The background colour that is chosen in a similar way.

The third option is for joystick or keyboard use, using standard Atari or Commodore joysticks, with eight direction movement. Keyboard controls are four directional, as follows:

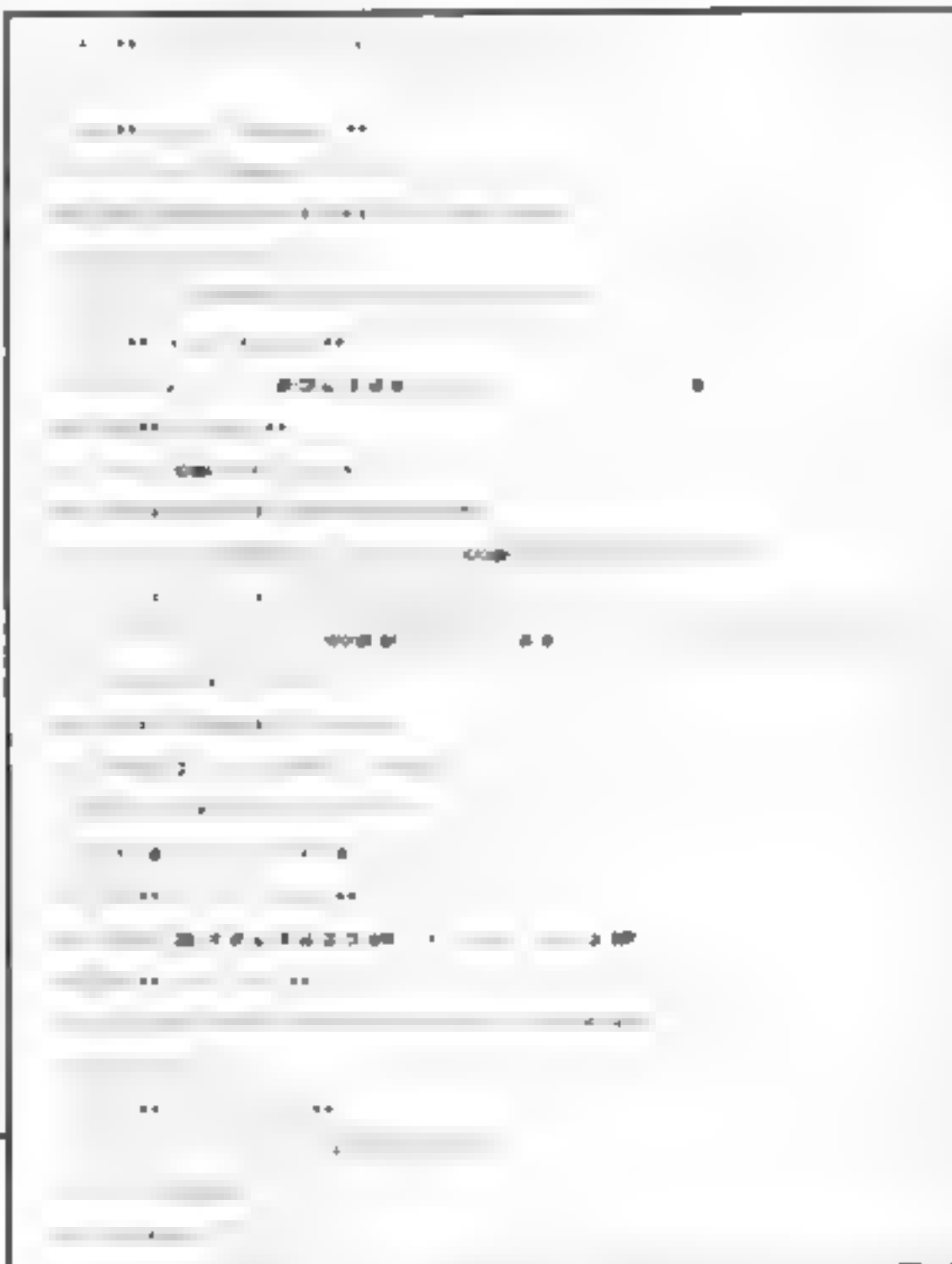
- Function key 1 up
- Function key 2 down
- Left arrow left
- Right arrow right

To draw lines with the joystick press fire, and with keyboard press CTRL, shift, or shift lock.

When all options have been decided, the screen will go blank apart from eight coloured squares in the top left corner, some words in the top right, and a flashing cross. The cross shows you your position on the screen.

If the cross is moved on to the top line you have access to three functions. When you have

Is there an artist in you trying to get out? Mike Roberts' program for the unexpanded VIC-20 will make you quick on the draw



Variables
 SC screen start location
 CR colour map start location
 CH current character under cross
 YL Y position of cross
 Q current draw colour
 0 zero constant
 CO colour register for border etc
 CRS carriage return constant
 GC graphics character at top right
 TW twenty constant
 WO two constant
 V length of save/load siren
 U/I temporary variables
 W one constant
 AS temporary variable
 A border colour
 B background colour
 L cross screen location
 C cross colour map location
 CC current colour under cross
 KJ keyboard joystick flag
 E temporary variable
 X cross X movement enable flag
 Y cross Y movement enable flag
 Z cross draw button enable flag
 P cross print enable flag
 X1 X position of cross
 D cross movement direction
 M/L1 siren loop variables
 S keyboard/joystick peek location
 S0 cross move up flag
 S1 cross move down flag
 S2 cross move right flag
 S3 cross move left flag
 F fire/draw button flag
 J key pressed for nib change

selected one of the functions then you will move to the line below.

The first function is a colour change. When you position the cross on one of the coloured squares and press the draw button (fire on shift etc.) that becomes the colour that you are drawing in.

The second function is SAVE. To save a picture you move the cross on to the word SAVE at the top of the screen and press the draw button. A warning siren will then go off, and if the button is then released nothing will happen.

But if the draw button is kept depressed, then instructions will follow at the top of the screen just as when saving a BASIC program.

The third function, LOAD, is identical in operation to SAVE and has the same instructions.

At start up, the default colour is black, and the shape that is printed on the screen is a reverse space character.

The character that is to be printed on the screen is shown in the top right hand corner of the screen. It can be changed at any time by just pressing the appropriate key on the keyboard, and the top right character will then change.

To access reverse field characters CTRL/RVS can be used prior to entering the desired character, and CTRL/RVS off afterwards.

```

400 PAI:HEART:THREAT
430 IF 1:4AND 1:2:4:AND
440 IF 1:7AND 1:8:HEART
450 GOTO400
460 IF 1:9AND 1:10:HEART
465 POKE 90:POKE 91:POKE 92:POKE 93:POKE 94:POKE 95:POKE 96:POKE 97
470 POKE 98:POKE 99:POKE 100:POKE 101:POKE 102:POKE 103:POKE 104:POKE 105
480 POKE 106:POKE 107:POKE 108:POKE 109:POKE 110:POKE 111:POKE 112:POKE 113
490 GOTO100
499 REM:READ:BY:94
500 S=0:SO=0:SL=0:SH=0:SD=0:SF=0:SS=0
505 POKE 31:POKE 32:POKE 33
510 IF 1:9AND 1:10:PEEK 31:POKE 32:POKE 33
520 IF 1:9AND 1:10:PEEK 32:POKE 33:POKE 34
530 IF 1:9AND 1:10:PEEK 33:POKE 34:POKE 35
540 POKE 36:POKE 37
550 RETURN
    
```

```

559 REM:MOVE:W:KEY:44
600 D=0:POKE 43:KEY:ERK:44
620 IF 5:9AND 5:10:KEY:HEART:44
630 IF 5:9AND 5:10:KEY:HEART:44
640 IF 5:9AND 5:10:KEY:HEART:44
650 IF 5:9AND 5:10:KEY:HEART:44
654 GET:AT:94:THE:KEY
655 IF 1:9AND 1:10:KEY:ERK:44:KEY:ERK:44:KEY:ERK:44:KEY:ERK:44
656 IF 1:9AND 1:10:KEY:ERK:44:KEY:ERK:44:KEY:ERK:44:KEY:ERK:44
670 POKE 98:POKE 99:POKE 100:POKE 101:POKE 102:POKE 103:POKE 104:POKE 105
690 IF 1:9AND 1:10:KEY:ERK:44:KEY:ERK:44:KEY:ERK:44:KEY:ERK:44
698 IF 1:9AND 1:10:KEY:ERK:44:KEY:ERK:44:KEY:ERK:44:KEY:ERK:44
699 POKE 90:POKE 91:POKE 92:POKE 93:POKE 94:POKE 95:POKE 96:POKE 97
    
```


VIC-20 PROGRAM

```

000 REM DR)
624 40000 GATE C... FE **
700 40  A..... 2 3 456 78...
A... 40000 40000 40000 40000
...

```



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Buck's turned nasty — he's out to flatten your city

How it works:

3-9 set up user-defined graphics
10 screen colours, GOSUB for
logo, ask for time, etc.
25-30 set up score, draw and
randomise enemy
31 print score, time
90-140 main program: movement
of enemy, check for enemy
position, time, print cities,
decrement time
500-590 enemy explosion routine
900-930 screen details
1000-1400 flashing ground
1500-1506 screen details
1511-1520 target sight
2000-2010 check if time equals
25 for extra life
3000-3070 controls flight of
enemy
4000-4007 logo

Ground Attack is for everyone who can't stand Buck Rodgers — now you have a chance to shoot him down

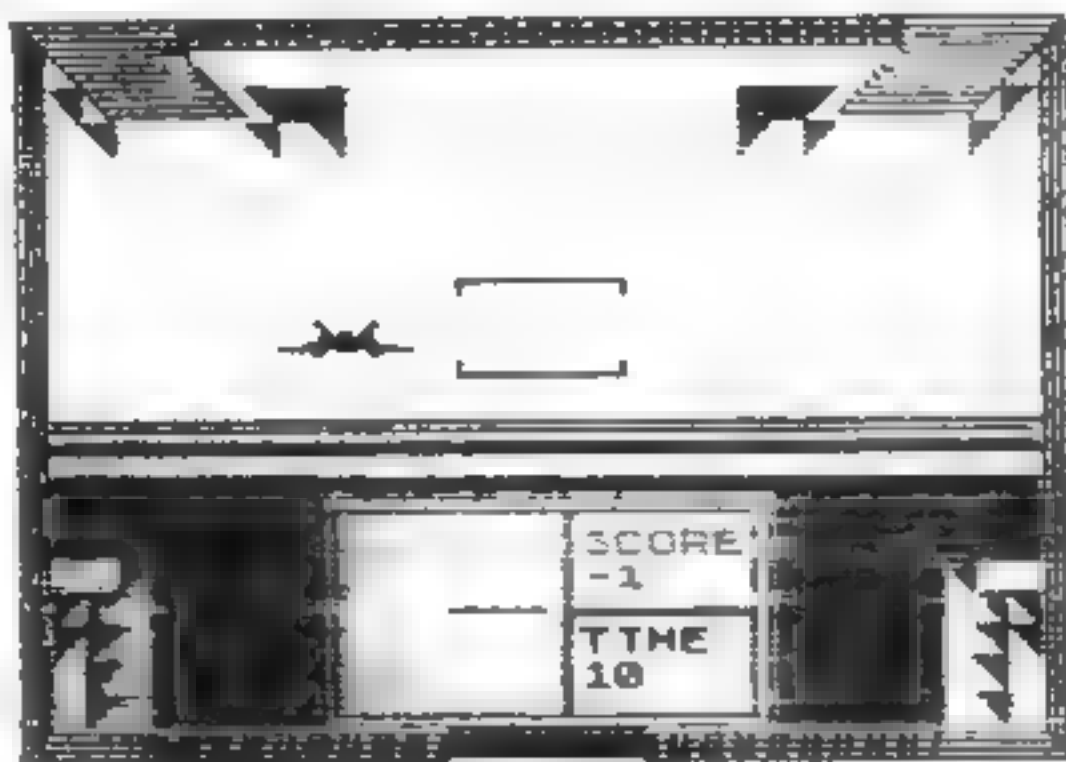
After you have chosen your time — displayed in a panel — a city becomes visible and Buck will start his run from the top of the screen

He might not be visible at this stage, but when his attack begins the time will start to count down and target lines will appear

Variables

tco start time
co current time
sc score
AS spacecraft
x start of AS
Px end of AS
lf lives total
y lines from top
z random factor

Buck Rodgers seems to have gone over to the enemy. Type Sandy MacLennan's program into your Spectrum quickly, before innocent cities are blasted out of existence



Here comes Buck, swooping in over your city — what the screen looks like when you play Ground Attack

Buck moves randomly across the screen, but you can bring him into your line of fire by using the right and left cursor keys. Your fire button is the down cursor key

Every time you destroy Buck your start time is reduced by one. If you manage this within 10 per cent of your time then your time for the next game is halved

Each destroyed craft earns you 100 points, plus the unused amount of time. A negative time is deducted from your score

When your time is down to 25 you will gain an extra man and this will be identified by a BEEP.

Although the program is written entirely in BASIC, it runs relatively fast because only that which must move does so

The ground uses black and yellow bands of varying thicknesses which flash alternately to simulate perspective.

It is possible for Buck's craft to leave your line of sight, achieved by AS which is 44 characters long and is always printed at one space in from the side and the number of characters displayed is determined by the right and left cursor keys and by the random factor z.

This allows the craft, or part of the craft, to be displayed anywhere along the line of movement

To make the game more tricky, just reduce the figure .9 in line 2002. You could also add another enemy spacecraft

The user-defined graphics: A-D enemy spacecraft, E bars for ground, F-H the city, I and J triangular segments, K and L laser bolts

```

2 GO TO 10
3 FOR i=144 TO 155
4 FOR j=0 TO 7 READ b
5 POKE USR CHR$ i+j,b NEXT j
NEXT i
6 DATA 0,0,0,0,0,3,191,0,0,0,
0,0,0,192,253,0,192,32,49,59,127,
,255,227,192,3,4,140,220,254,255
199,3
7 DATA 0,255,0,0,255,255,255,
0,144,144,255,213,255,157,157,25
5,9,9,255,171,255,185,185,255,0,
0,90,255,189,231,195,195
8 DATA 255,127,63,31,15,7,3,1
,255,254,252,248,240,224,192,128
9 DATA 240,240,240,240,24,4,2
,1,15,15,15,31,24,32,64,128
10 BORDER 0: PAPER 7: INK 0: C
LS GO SUB 4000: INPUT "difficu
lty 100-20 ";tco
20 INK 0: DRAW 255,0: DRAW 0,1
75: DRAW -255,0: DRAW 0,-175
21 GO SUB 300
22 GO SUB 1000
23 GO SUB 1500
24 GO SUB 1500
25 LET lf=3
26 LET sc=0
27 DIM A$(1,32 TO 35)="ACDE"
28 LET A=4: LET B=9: LET C=1
30 LET x=INT (RND*34): LET y=4: GO

```

```

SUB 3000: LET tco=tco-1: LET co=
tco
31 PRINT AT 15,17: PAPER 1: IN
K 7;"SCORE";AT 16,17:" ";AT
16,17;sc;AT 18,17:"TIME ";AT 19,
17
90 LET co=co-1: PRINT AT 19,17
; PAPER 1: INK 7;co;"
91 IF co=0 THEN FOR k=1 TO lf:
PRINT AT 11,INT (RND*15)+4; PAP
ER 1: INK 4;"FHG": NEXT k
92 IF ATTR (11,34-x)=12 AND co
<0 THEN PRINT AT 11,32-x: OVER 1
; PAPER 1: INK 3;"***": LET A=9
LET B=4: LET C=-1: LET sc=sc+c
): GO SUB 3000: LET lf=lf-1: GO
TO 2000
100 IF INKEY$="" OR INKEY$="5"
THEN LET z=INT (RND*3): LET x=x+
z-1: BEEP .005,x
110 IF INKEY$="5" THEN LET x=x+
1: BEEP .005,x
115 IF INKEY$="8" THEN LET x=x-
1: BEEP .005,x
116 IF INKEY$="6" THEN LET f=1
PAPER 1: INK 7: FOR i=4 TO 8 ST
EP 2: BEEP .002,i: PRINT AT i,f+
9;"K";AT i,22-f;"L";AT i,f+9;"
";AT i,22-f;" " LET f=f+2: NEXT
i
120 LET Px=x+29

```


SPECTRUM PROGRAM

```

121 IF X<2 THEN LET X=1
122 IF X>15 THEN LET PX=44
130 PRINT AT Y,1; PAPER 8, INK
7;A$(1,X TO PX)
140 IF INKEY$="6" AND 34-X=15 T
HEN LET SC=SC+100+CO. PRINT AT 9
,14; PAPER 1, INK 2, OVER 1,"0+*
0": GO SUB 500: GO TO 2000
400 GO TO 90
500 LET FH=3
501 PAPER 1, INK 6
502 LET TR=15 FOR J=16 TO 28
503 BEEP .005,J PRINT AT 9,J,"
","B";AT 9,TR-1,"A",AT FH,TR,"
",AT FH,J,""
504 LET TR=TR-1 LET FH=FH-3
505 BEEP .002,FH PRINT AT FH,t
,"C",AT FH,J,"D" NEXT J
590 RETURN
900 PRINT AT 3,10, PAPER 1;"
902 PRINT AT 2,10; PAPER 1;"
903 PRINT AT 3,9; PAPER 7; INK
0,"I",AT 3,22;"J";AT 2,7;"I";A
T 2,22,"J"
904 PRINT AT 3,7; INK 7; PAPER
1,"I",AT 3,24;"J"
906 PRINT AT 3,3; PAPER 1;"
AT 3,25;"
909 FOR I=4 TO 11
910 PRINT AT I,1; PAPER 1;"
920 NEXT I
930 RETURN

```

```

1000 INK 7; PLOT 8,80: DRAW 240,
0: INK 0
1002 FLASH 1; PRINT AT 12,1; PAP
ER 6;"EEEEEEEEEEEEEEEEEEEEEE
EEEE"
1003 PRINT AT 13,1; PAPER 6; INK
0,""
1004 PRINT AT 14,1, PAPER 6, INK
0,"";AT 14,23;"
1005 PRINT AT 15,1; PAPER 0, INK
6;"";AT 15,23,""
1007 PRINT AT 16,4; PAPER 0; INK
6;"";AT 16,23;""
1008 PRINT AT 17,4, PAPER 6, INK
0,"";AT 17,23;""
1009 PRINT AT 18,4, PAPER 6, INK
0,"";AT 18,23;""
1010 PRINT AT 19,4, PAPER 6, INK
0,"";AT 19,23;""
1011 PRINT AT 20,4, PAPER 6, INK
0,"";AT 20,23;""
1012 PRINT AT 21,4, FLASH 0, PAP
ER 7, INK 0, OVER 1,"HHHHHHHHH
HHHHHHHHH"
1019 FLASH 0
1020 LET T=3. FOR I=16 TO 18
1030 PRINT AT I,1, INK 4; PAPER
7,"J",AT I,31-T,"I". LET T=T-1:
NEXT I
1040 PRINT AT 16,1, PAPER 4; INK
0,"";AT 16,22,"";AT 17,1,"J
",AT 17,30,"I"
1050 PRINT AT 3,1; INK 7, PAPER
2,"I",AT 3,29;"J",AT 2,1;"I";A
T 2,30,"J"
1100 PLOT 133,10
1102 DRAW 0,49: DRAW 45,0: DRAW
0,-49. DRAW -45,0: PLOT 134,34.
DRAW 44,0: DRAW 0,1: DRAW -44,0
1109 PLOT 76,10
1110 DRAW 0,49: DRAW 56,0: DRAW
0,-49. DRAW -56,0: PLOT 81,35: D
RAW 46,0
1111 PLOT 73,8
1112 DRAW 0,54: DRAW 109,0: DRAW
0,-54. DRAW -109,0
1113 PLOT 0,175: DRAW 24,-24: PL
OT 255,175: DRAW -24,-24
1114 PLOT 40,168: DRAW 16,-16: P
LOT 215,168: DRAW -16,-16
1115 PLOT 40,168: DRAW 0,7: PLOT
215,168: DRAW 0,7
1120 PRINT AT 18,2; PAPER 0;

```

```

7;"J";AT 18,29;"I"; BRIGHT 1;AT
19,2;"J";AT 19,29;"I";AT 20,2;"
J";AT 20,29;"I"; BRIGHT 0
1130 PRINT AT 0,5; OVER 1;"HHHHH
HHHHHHHHHHHHHHHHHHHH"; OVER 0
1140 FOR J=1 TO 21 STEP 2
1150 PRINT AT J,0, OVER 1;"X";AT
J,31;"X": NEXT J
1160 LET DE=0. FOR J=167 TO 153
STEP -2
1170 PLOT 8+DE,J: DRAW 32,0: PLO
T 247-DE,J. DRAW -32,0: LET DE=DE
+2 NEXT J
1200 FOR I=15 TO 19
1210 PRINT AT I,10; OVER 1; PAPE
R 4;"": NEXT I: OVER 0
1400 RETURN
1500 PLOT 2,2
1501 DRAW 251,0: DRAW 0,171: DRA
W -251,0: DRAW 0,-171
1502 PLOT 4,4
1503 DRAW 247,0: DRAW 0,167: DRA
W -247,0: DRAW 0,-167
1504 PLOT 6,6
1505 DRAW 243,0: DRAW 0,163: DRA
W -243,0: DRAW 0,-163
1506 RETURN
1511 INK 7; PLOT 107,94: DRAW 0,
-3: DRAW 40,0. DRAW 0,3
1512 PLOT 107,110: DRAW 0,3: DRA
W 40,0: DRAW 0,-3
1520 RETURN

```

```

2001 IF TCO=25 OR TCO=25 AND SC)
3500 THEN LET LI=LI+1: BEEP .05,
LI
2002 IF CO/TCO>.9 THEN LET TCO=I
NT (TCO/2)
2003 FOR I=1 TO 50: BEEP .001,I
2004 NEXT I
2005 IF LI=0 THEN INK 0: STOP
2006 GO SUB 900
2007 PRINT AT 11,1; PAPER 1;"

```

```

2010 GO TO 30
3010 FOR I=A TO B STEP C
3011 PAUSE 10
3020 LET Z=INT (RND*5)
3030 PRINT AT Y,1; PAPER 1;"
3040 LET X=X+Z-2: LET Y=Y+1: LET P
X=X-29
3041 IF X<2 THEN LET X=1
3042 IF X>15 THEN LET PX=44
3050 PRINT AT Y,1; PAPER 1; INK
9;A$(1,X TO PX)
3060 NEXT I
3070 GO SUB 1511: RETURN
4000 FOR I=0 TO 50
4001 POKE 23607,I: FLASH 1
4002 PRINT AT 10,9;"GROUND ATTAC
K"
4003 PRINT AT 11,11;"by A.G.M."
4004 PRINT AT 7,14; INK 2; FLASH
0;"ACDB"
4005 NEXT I
4006 FLASH 0
4007 RETURN

```



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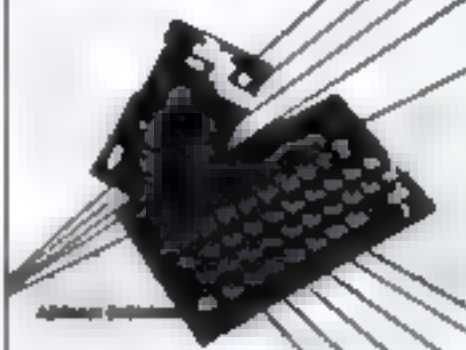
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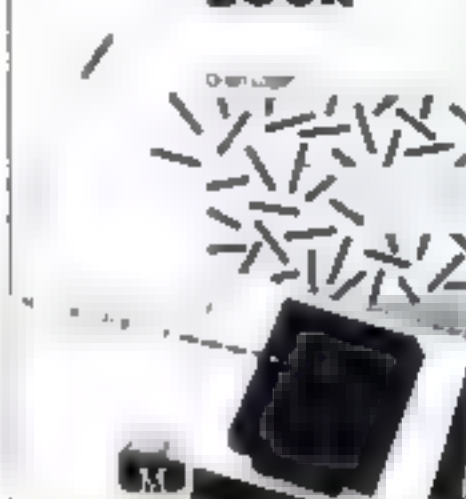
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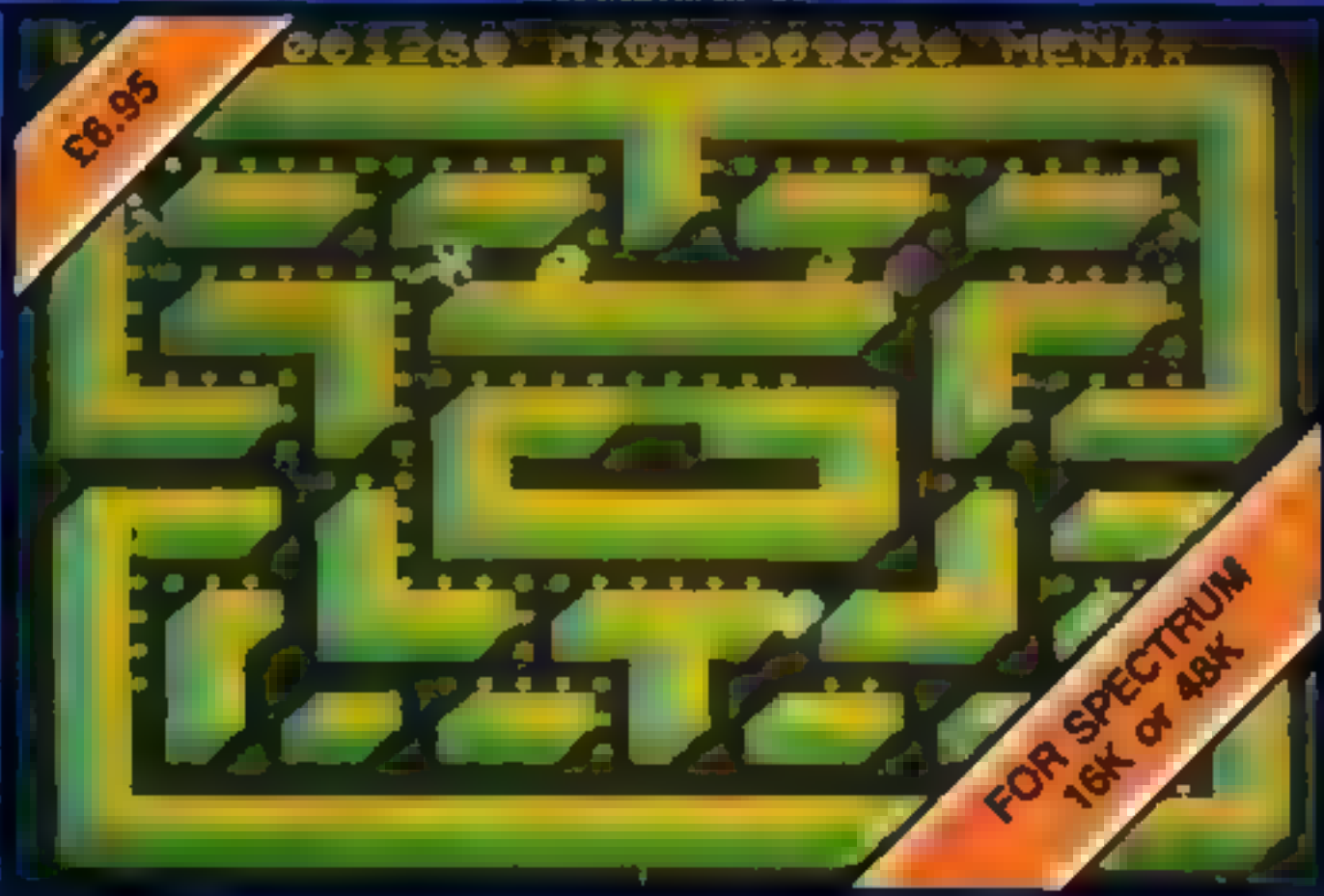
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How to perk up your Oric's graphics

Do your graphics look odd, have they lost their symmetry? Why not perk them up with a POKE or two?

That such an excellent machine as the Oric-1 should have a bug in its graphics is disappointing. Nevertheless, it is not that serious and there is a cure. (A hot-water bottle and two aspirin don't work.)

The specification for the Oric says that horizontal resolution is 240 pixels or 40 characters per

If you're grappling with graphics on your Oric, Alan Welch has some sound advice

The program on page 89 of the Oric manual can be used, with table 1 to redefine the graphics set by changing the first statement in line 70 to A=47112. But, be warned, this program displays the characters/graphics in 8 x 8 block as stored in ROM and at eight times normal size, including the two left-hand columns that are supposed when the character is printed.

With a total of 96 graphics at 8 bytes each, that's 768 locations to

ASCII CODE	ROW							
	0	1	2	3	4	5	6	7
33		56			0		0	
34		7			0			
35		63			0			
36		0			56			
37		56			56			
38		7			56			
39		63			56			
40		0			7			
41		56			7			
42		7			7			
43		63			7			
44		0			63			
45		56			63			
46		7			63			
47		63			63		0	
48		0			0		56	
49		56			0			
50		7			0			
51		63			0			
52		0			56			
53		56			56			
54		7			56			
55		63			56			
56		0			7			
57		56			7			
58		7			7			
59		63			7			
60		0			63			
61		56			63			
62		7			63			
63		63			63		56	
64		0			0		7	
65		56			0			
66		7			0			
67		63			0			
68		0			56			
69		56			56			
70		7			56			
71		63			56			
72		0			7			
73		56			7			
74		7			7			
75		63			7			
76		0			63			
77		56			63			
78		7			63			
79		63			63		7	
80		0			0		63	
81		56			0			
82		7			0			
83		63			0			
84		0			56			
85		56			56			
86		7			56			
87		63			56			
88		0			7			
89		56			7			
90		7			7			
91		63			7			
92		0			63			
93		56			63			
94		7			63			
95		63			63			

Table 1 — a listing to be used to POKE correct graphics into the Oric, using the program on page 89 of the manual. The row number 0 to 7 should be input in reply to on-screen prompts

line, i.e. a character block is six pixels wide.

The graphics are, however, stored with an eight pixel width and when printed on the screen loses its two left-most columns. See figure 1.

The standard graphic set is constructed in a block format, each box having binary place value.

The code for a particular symbol is the total of its place values plus 32, as in figure 2. The ASCII character associated with this code number gives the graphic symbol when in ESC 'I' mode — see figure 3.

The 6 x 2 block format gives us 2⁶ equalling 64 different symbols (including blank) directly related to the ASCII codes.

The remaining 32 graphics can be defined as anything you wish and allows great scope for experimentation to produce realistic aliens, explosions and so on.

check or alter and using this program would take well over an hour after you have entered the program.

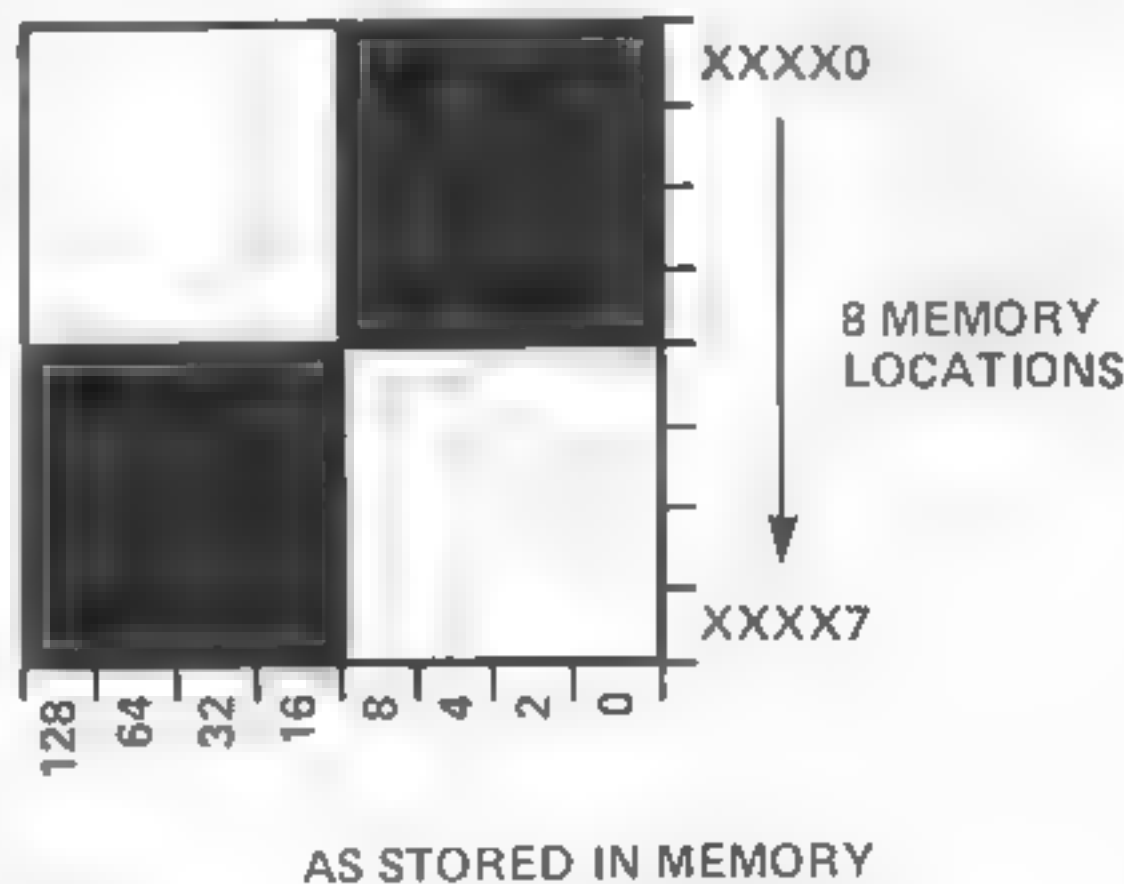
So it is advisable only to redefine those that are absolutely necessary. Better still, redefine from within a program.

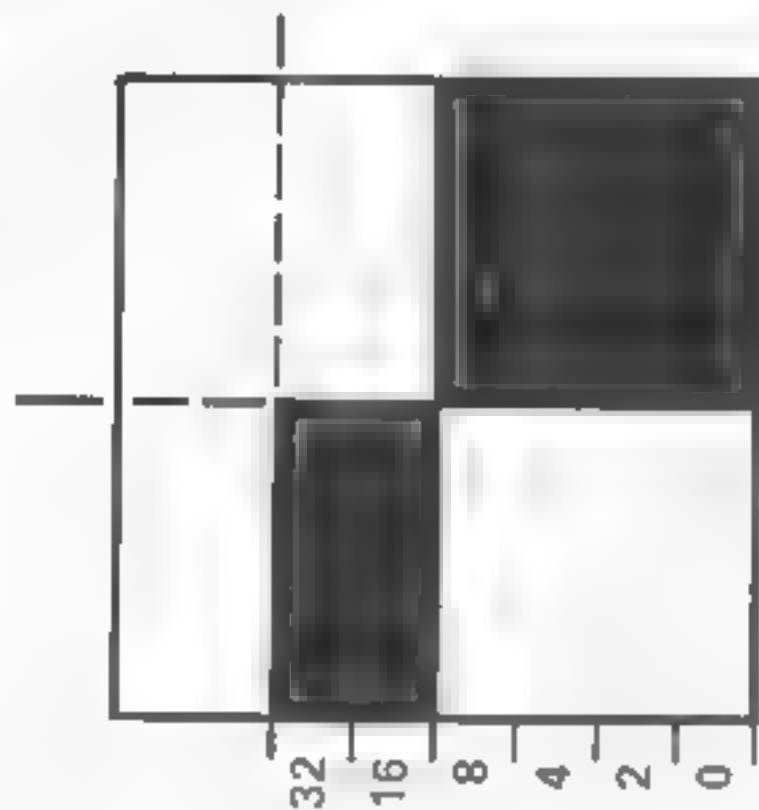
This is why I am working on a program to redefine the standard graphics plus 33 special characters for use on its own or incorporated into a program.

Warning. Using the reset switch will delete any redefined character and replace them with the originals held in ROM.



Figure 1 — how graphics are stored and displayed



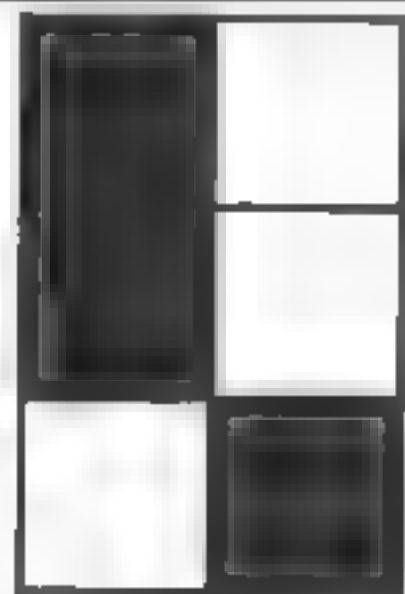


AS PRINTED ON SCREEN

Figure 2 — the standard graphics set is made up of six boxes, each of which is either full or empty



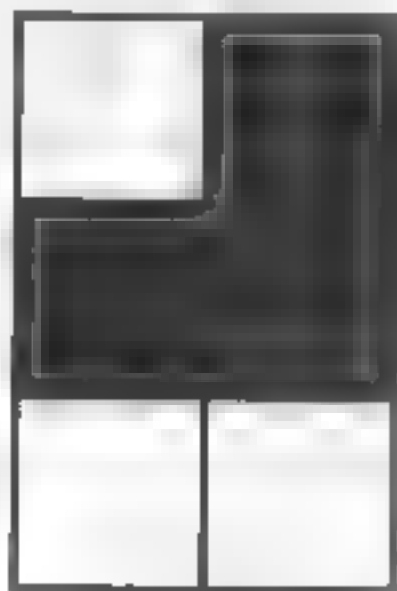
Figure 3 — how the code for each symbol is calculated



CODE = 2 + 4 + 8 + (32)
= 46 (ASCII.)

e.g. CURSOR →, ESC, I, E WILL PRINT

CODE = 1 + 4 + 32 + (32)
= 69 (ASCII E)



In the new era, will you be in the know?

We have come a long way since the home-computing industry really began with the ZX80.

Heralding a new era in computing, it offered black and white, chunky graphics, a flickering screen, 1K of RAM, a bonk-sensitive keyboard, with a free, built in egg-fryer.

Offered for sale at £100, people snapped them up, eager to get into what promised to be the hobby of the future.

But the really important aspect of the ZX80 was that it proved to the world, what could be achieved with a little ingenuity and a lot of hard work

Since that day, progress has been fast — very fast. It is now possible to buy a microcomputer with colour, sound, hi-res graphics, moving key keyboard, fast cassette storage and more than 40K of usable random access memory for under £125

If the car industry had progressed at this speed, automobiles would be two pence each, and disposable. But how far can we really go? How soon will it be before the ultimate software is produced, and what next?

Over the years, games software has improved to an amazing standard. Now, 3D games with astonishing sound-effects can be purchased for less than £10. Some of these games are more complex, and indeed faster than some of their arcade counterparts.

Games today have to be more than just shoot-until-you-die, like Space Invaders, or Pacman.

Today games must have a goal, whether the game is Zaxxon, Penetrator, or a game of the adventure genre, such as Philosopher's Quest, Valhalla or The Hobbit. Standards are improving at an increasing rate.

However, this cannot go on forever, and ultimately new ways of using computers must be found. Perhaps, instead of a flight simulator program, the computer will interface to a radio-controlled plane, with a built in processor and video camera, and the simulations will get closer to reality. But how real can a simulator be?

Indeed, the computer literate will be looking for new ways to amuse themselves. Already, a modem can be purchased for under £50, or a complete database terminal peripheral for under £100.

Very soon the society we live in will be virtually run by computers. However, it will not be controlled by computers, it will be controlled by those with enough knowledge to program or reprogram these computers, and perhaps they won't all be teenage hackers

OK, so the American Defence Computer is probably very safe, but what about the many other computer systems that might not be quite so safe? Wargames is a stark warning of what could happen, but many will scorn it. Perhaps almost as many who scorned the idea of ever landing on the moon.

David Harrison
School Kid & Teenage Hacker
Burgess Hill, West Sussex

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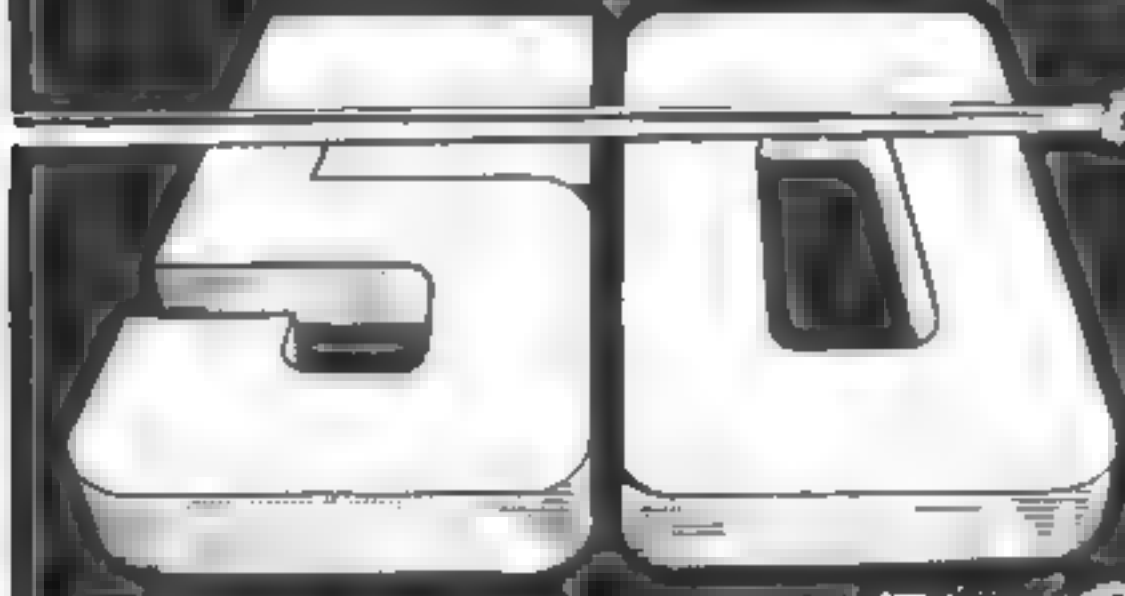
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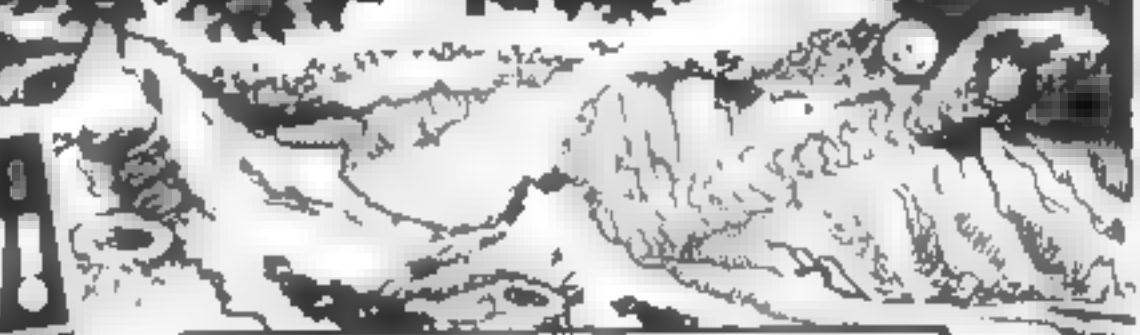
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There's heaps of trouble on the grisly grid

As my game begins you find yourself precariously perched on a grid — and that's the only thing between you and the gaping mouth of an atomic reactor.

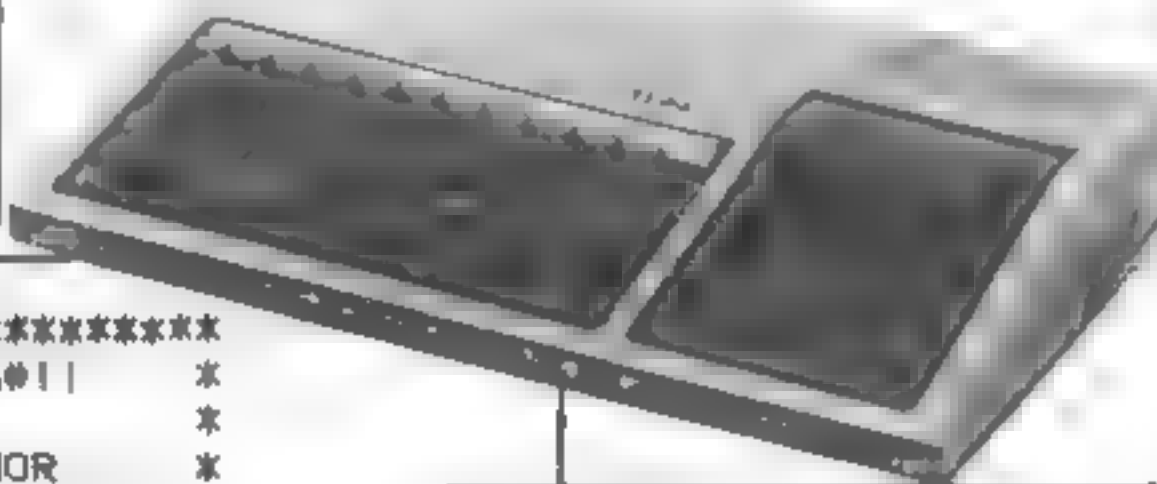
Dotted about the grid are a number of piles of atomic dust, and your task is to collect them. Every time you succeed, your score increases.

But there's a catch — in fact, there are two. As you move, random static appears along your route, and if you touch it, instant death follows. Falling off the grid into the reactor won't do you much good either.

The game includes instructions, an initialised high score routine, and a selectable skill level which determines the number of dustpiles available.

If you collect more than 20 piles, a new game starts and your score increases. Off you go — and watch your step.

If you think you can keep your balance, try your skill in Frank O'Connor's electrifying game for the TI-99/4A



How it works
 10-350 initialise, define characters, set up variables
 360-430 set up grid
 440-510 define headings
 620-730 print characters
 740-850 define headings
 860-920 scan keyboard for input
 930-1400 move man. Check for losing position
 Sound Routine
 1410-1540 place random static on grid
 1510-1650 losing subroutine (off grid)
 1660-1700 check for high score
 1710-1870 ask player for another game and key input
 1880-2060 losing subroutine (Hits static)
 2070-2230 score update
 2230-2490 master card routine for instructions
 2510-2960 print instructions
 2970-3050 "print at" subroutine
 3060-3230 new high score sub

```

10 CALL CLEAR
20 *****
30 *||#ELECTRON#|| *
40 REM *
50 REM *FRANK OCONNOR *
60 REM *****
70 LET K=1
80 LET PSN=5
90 GOSUB 2260
100 LET ZS=0
110 LET SC=0
120 RANDOMIZE
130 LET DRF=0
140 CALL CLEAR
150 PRINT "SKILL LEVEL:(1-10)"
160 INPUT "10=EASY 1=HARD" SL
170 IF (SL>10)+(SL<1) THEN 140
180 CALL CLEAR
190 LET ZS=ZS+1
200 LET DRF=DRF+20
210 CALL SCREEN(7)
220 CALL CHAR(128,"FFFFFFFFFFFFFF")
230 CALL COLOR(13,5,1)
240 LET IJN=IJN+1
250 CALL CHAR(159,"101010000000")
260 CALL COLOR(16,16,1)
270 CALL CHAR(144,"307E7EFFFFFF7E30")
280 CALL COLOR(15,8,1)
290 LET ROW=12
300 LET CLM=16
310 LET SND=110
320 CALL CHAR(33,"3030995A30183003")
330 CALL CHAR(34,"303018FF1899FF")
340 CALL COLOR(1,2,1)
350 REM **SET UP SCREEN**
360 FOR C=1 TO 24 STEP 3
370 CALL HCHAR(C,1,128,32)
380 CALL SOUND(100,323,0)
390 NEXT C
400 FOR C=1 TO 32 STEP 3
410 CALL VCHAR(1,C,128,24)
420 CALL SOUND(100,232,0)
    
```

```

430 NEXT C
440 LET MS="GAME"
450 LET K=1
460 LET PSN=17
470 GOSUB 2980
480 LET MS=STR$(ZS)
490 LET PSN=21
500 GOSUB 2980
510 LET MS=US
520 LET K=24
530 LET PSN=1
540 GOSUB 2980
550 LET MS="**HIGH SCORE="
560 LET K=24
570 LET PSN=16
580 GOSUB 2980
590 LET MS=STR$(HS)
600 LET PSN=30
610 GOSUB 2980
620 FOR C=1 TO (SL+20)
630 LET RRR=INT(23*RND)+1
    
```

```

640 IF RRR=1 THEN 630
650 LET CCC=INT(32*RND)+1
660 IF RRR=12+CCC=16 THEN 630
670 CALL GCHAR(RRR,CCC,G)
680 IF G=32 THEN 630
690 CALL HCHAR(RRR,CCC,144)
700 CALL SOUND(100,789,0)
710 NEXT C
720 CALL HCHAR(ROW,CLM,33)
730 CALL SOUND(100,1000,0)
740 LET MS="ELECTRON"
750 LET PSN=24
760 LET K=1
770 GOSUB 2980
    
```

Hints on conversion
 Texas BASIC has some unusual commands for graphics and sound.
CALL CHAR (number, hexadecimal string) controls the user definition of characters. Number refers to the ASCII code of the redefined character.
CALL HCHAR (row, column, number) prints the character whose ASCII code is number at position row, column on the screen. The TI-99/4A has a screen size of 24 rows by 32 columns.
CALL GCHAR (row, column, variable) is the equivalent of PEEK. The ASCII code of the character at position row, column on the screen is left in the designated variable.
CALL SOUND (d, f, v) sounds a note of frequency, f, duration d in microseconds and volume v.
CALL KEY (O, K, S) the equivalent of INKEYS, will leave the ASCII code of the key pressed in the variable.
CALL CLEAR clears the screen. A direct equivalent of CLS.

TI-99/4A PROGRAM

```

780 LET M$="YOUR SCORE= "
790 LET PSN=1
800 LET K=1
810 GOSUB 2980
820 LET M$=STR$(SC)
830 LET PSN=12
840 LET K=1
850 GOSUB 2980
860 CALL KEY(3,K,S)
870 IF S=0 THEN 860
880 IF K=68 THEN 930
890 IF K=88 THEN 1020
900 IF K=69 THEN 1110
910 IF K=83 THEN 1200
920 GOTO 860
930 REM MOVE RIGHT#
940 LET CLM=CLM+1
950 IF CLM>32 THEN 1000
960 CALL HCHAR(ROW,CLM-1,128)
970 GOSUB 1290
980 GOSUB 1420
990 GOTO 860
1000 LET CLM=CLM-1
1010 GOTO 860
1020 REM MOVE DOWN#
1030 LET ROW=ROW+1
1040 IF ROW>23 THEN 1090
1050 CALL HCHAR(ROW-1,CLM,128)
1060 GOSUB 1290
1070 GOSUB 1420
1080 GOTO 860
1090 LET ROW=ROW-1
1100 GOTO 860
1110 REM MOVE UP#
1120 LET ROW=ROW-1
1130 IF ROW<2 THEN 1180
1140 CALL HCHAR(ROW+1,CLM,128)
1150 GOSUB 1290
1160 GOSUB 1420
1170 GOTO 860
1180 LET ROW=ROW+1
1190 GOTO 860
1200 REM MOVE LEFT#
1210 LET CLM=CLM-1
1220 IF CLM<1 THEN 1270
1230 CALL HCHAR(ROW,CLM+1,128)
1240 GOSUB 1290
1250 GOSUB 1420
1260 GOTO 860
1270 LET CLM=CLM+1
1280 GOTO 860
1290 REM MOVEMENT+SOUND+CHECKS
1300 CALL GCHAR(ROW,CLM,G)
1310 IF G=32 THEN 1520
1320 IF G=139 THEN 1880
1330 IF G=144 THEN 2080
1340 CALL HCHAR(ROW,CLM,34)
1350 CALL SOUND(100,-3,0)
1360 CALL SOUND(50,-3,15)
1370 CALL HCHAR(ROW,CLM,33)
1380 CALL SOUND(100,2000,3)
1390 CALL SOUND(-30,2000,0)
1400 RETURN
1410 REM STATIC
1420 LET OOO=INT(23*RND)+1
1430 LET PPP=INT(32*RND)+1
1440 IF OOO=1 THEN 1420
1450 CALL GCHAR(OOO,PPP,G)
1460 IF G=32 THEN 1420

```

```

1470 IF G=144 THEN 1420
1480 CALL HCHAR(OOO,PPP,159)
1490 CALL SOUND(10,-3,0,110,0)
1500 RETURN
1510 REM HIT PHOTON (GS)
1520 FOR C=1 TO 10
1530 CALL COLOR(13,16,1)
1540 CALL SOUND(100,-7,0)
1550 CALL COLOR(13,5,1)
1560 CALL SOUND(100,-5,0)
1570 NEXT C
1580 LET M$="YOU FELL INTO A PHOTON"
1590 LET PSN=5
1600 LET K=11
1610 GOSUB 2980
1620 LET M$="GENERATING MODULE....."
1630 LET PSN=5
1640 LET K=12
1650 GOSUB 2980
1660 REM HIGH SCORE CHECK
1670 IF IJN=1 THEN 1680 ELSE 1700
1680 LET HS=SC
1690 GOTO 3060
1700 IF SC>HS THEN 3060
1710 REM END ROUTINE
1720 LET M$="ANOTHER GAME ?"
1730 LET K=18
1740 LET PSN=5
1750 GOSUB 2980
1760 LET M$=U$
1770 LET K=18
1780 LET PSN=18
1790 GOSUB 2980
1800 LET M$="IF YES KEEP Y PRESSED.."
1810 LET K=19
1820 LET PSN=5
1830 GOSUB 2980
1840 CALL KEY(3,K,S)
1850 IF S=0 THEN 1800
1860 IF K=89 THEN 180
1870 END
1880 REM HIT STATIC
1890 LET CLR=1
1890 LET CLR=1
1900 FOR C=1 TO 14
1910 LET CLR=CLR+1
1920 CALL COLOR(1,CLR,CLR+1)
1930 CALL SOUND(100,-7,5,800,0)
1940 CALL SOUND(300,-7,0,800,5)
1950 NEXT C
1960 CALL-COLOR(1,1,1)
1970 CALL SOUND(100,220,0)
1980 LET M$="YOU CAUSED A STATIC"
1990 LET PSN=6
2000 LET K=11
2010 GOSUB 2980
2020 LET M$="OVERLOAD~~~~~"
2030 LET PSN=6
2040 LET K=12
2050 GOSUB 2980
2060 GOTO 1670
2070 REM COLLECT SLIME
2080 FOR C=1 TO 5
2090 LET SND=SND+300
2100 CALL SOUND(10,SND,0)
2110 NEXT C
2120 CALL HCHAR(ROW,CLM,33)
2130 CALL HCHAR(ROW,CLM,34)
2140 LET SC=SC+1

```


TI-99/4A PROGRAM

```

2150 IF SC=DRF THEN 190
2160 LET M$=STR$(SC)
2170 LET PSN=12
2180 LET K=1
2190 GOSUB 2980
2200 IF SND<6000 THEN 860
2210 LET SND=110
2220 GOTO 860
2230 REM MASTER CARD
2240 LET PSN=5
2250 LET K=5
2260 FOR G=1 TO 3
2270 LET M$="!!#ELECTRON#!!"
2280 GOSUB 2980
2290 CALL COLOR(16,16,1)
2300 CALL COLOR(15,8,1)
2310 LET K=K+1
2320 NEXT G
2330 LET PSN=5
2340 LET K=16
2350 LET M$="COPYRIGHTFRANK O'CONNOR..."
2360 GOSUB 2980
2370 LET M$="DO YOU WANT INSTRUCTIONS"
2380 LET PSN=5
2390 LET K=20
2400 REM INSTRUCTIONS
2410 GOSUB 2980
2420 LET M$="Y OR N...."
2430 LET K=22
2440 LET PSN=5
2450 GOSUB 2980
2460 CALL KEY(0,K,S)
2470 IF K=89 THEN 2500
2480 IF K=78 THEN 2490 ELSE 2420
2490 RETURN
2500 CALL CLEAR
2510 PRINT "YOU ARE DEEP INSIDE "
2520 PRINT "THE COUNTRY'S NEWEST"
2530 DISPLAY "THERMO-NUCLEAR PHOTONIAL"
2540 PRINT "P.PH GENERATING PLANT"
2550 PRINT
2560 PRINT "YOUR JOB IS TO MANOUVER"
2570 PRINT "AROUND THE ELECTRO GRID"
2580 PRINT "COLLECTING ALL THE"
2590 PRINT "EXESS ATOMIC SLIME WHICH"
2600 PRINT "GATHERS ON THE GRID"
2610 PRINT "IN LITTLE BLUE PILES."
2620 PRINT
2630 PRINT "ALSO COLLECTING ON THE GRID"
2640 PRINT "ARE HIGH VOLTAGE STATIC"
2650 PRINT "PARTICLES WHICH MUST BE"
2660 PRINT "AVOIDED AT ALL COSTS"
2670 REM T "AND ARE WHITE."
2680 PRINT
2690 PRINT "PRESS ANY KEY FOR MORE....."
2700 CALL KEY(3,K,S)
2710 IF S=0 THEN 2700
2720 CALL CLEAR
2730 PRINT "POINTS TO REMEMBER ARE....."
2740 PRINT
2750 PRINT
2760 PRINT
2770 PRINT "1.YOU CONTROL THE MAN"
2780 PRINT "WITH THE CURSOR KEYS"
2790 PRINT
2800 PRINT "2.THE GRID IS 100 FT. ABOVE"
2810 PRINT "THE PHOTON GENERATING UNITS"
2820 PRINT "SO DON'T RUN OFF"

```

```

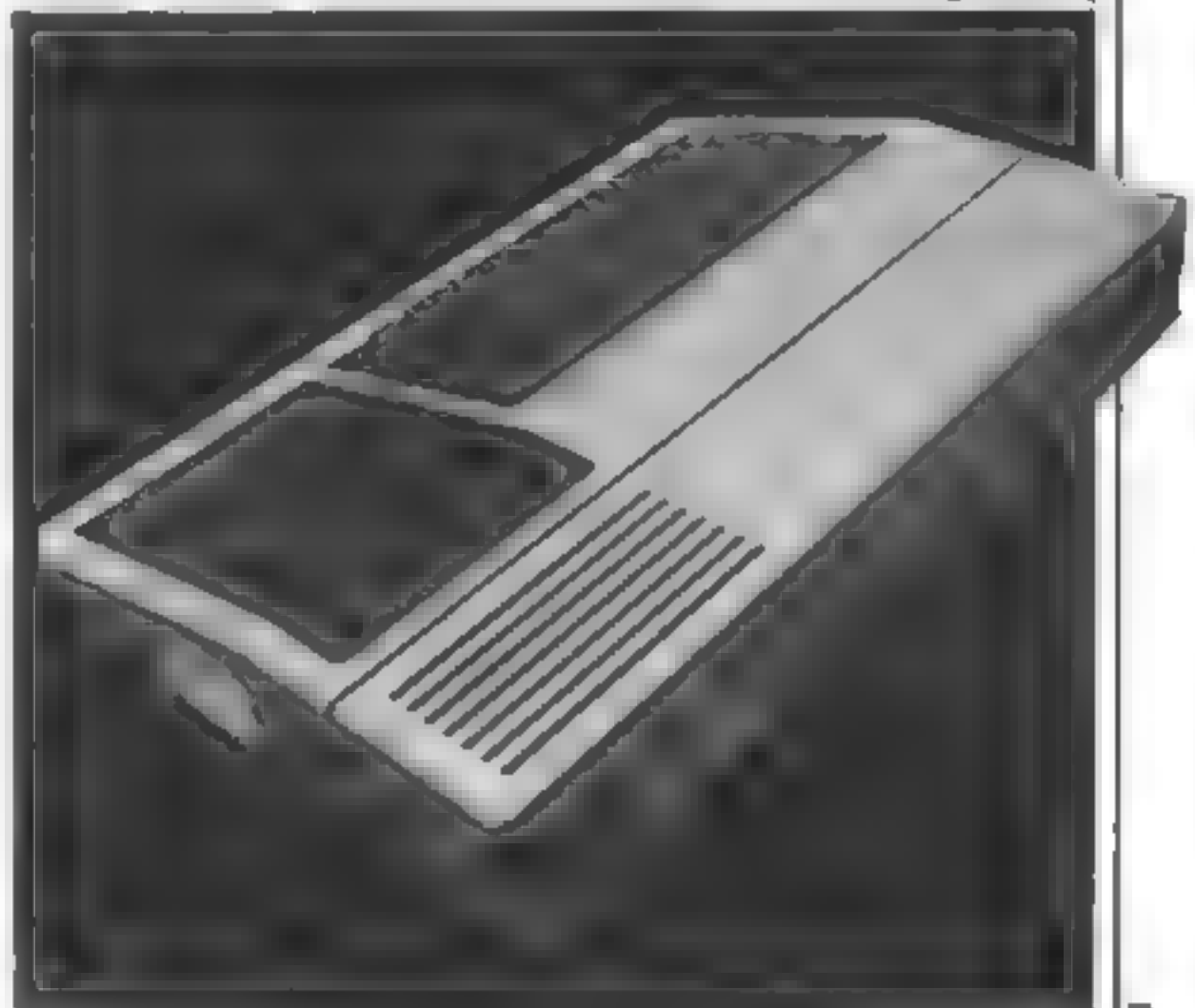
2830 PRINT
2840 PRINT "3.POINTS ARE GIVEN FOR"
2850 PRINT "EACH PILE OF SLIME YOU "
2860 PRINT "COLLECT"
2870 PRINT
2880 PRINT "4.YOU GET A NEW GAME EVERY"
2890 PRINT "20 POINTS."
2900 PRINT
2910 PRINT "PRESS R TO REPEAT"
2920 PRINT "OR P TO PLAY"
2930 CALL KEY(3,K,S)
2940 IF S=0 THEN 2930
2950 IF K=82 THEN 2500
2960 GOTO 140
2970 REM PRINT SUBROUTINE
2980 FOR C=1 TO LEN(M$)
2990 CH=ASC(SEG$(M$,C,1))
3000 CALL HCHAR(K,PSN+C,30)
3010 CALL SOUND(100,3000,0)
3020 CALL HCHAR(K,PSN+C,32)
3030 CALL HCHAR(K,PSN+C,CH)
3040 NEXT C
3050 RETURN

```

```

3060 REM NEW HIGH SCORE
3070 CALL SCREEN(12)
3080 CALL COLOR(1,7,7)
3090 CALL SOUND(1000,262,0,330,0)
3100 CALL SOUND(1000,262,0,392,0)
3110 CALL SOUND(1000,330,0,392,0)
3120 LET M$="A NEW HIGH SCORE***"
3130 LET K=12
3140 LET P=5
3150 GOSUB 2980
3160 LET HS=SC
3170 CALL CLEAR
3180 PRINT "WHAT IS YOUR NAME ? "
3190 CALL COLOR(1,12,12)
3200 INPUT "UP TO 14 LETTERS" : U$
3210 IF LEN(U$)>14 THEN 3200
3220 CALL CLEAR
3230 GOTO 1720

```



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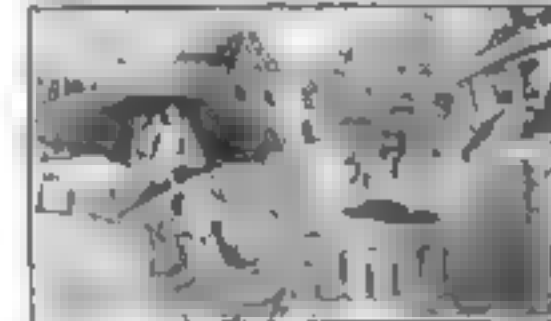
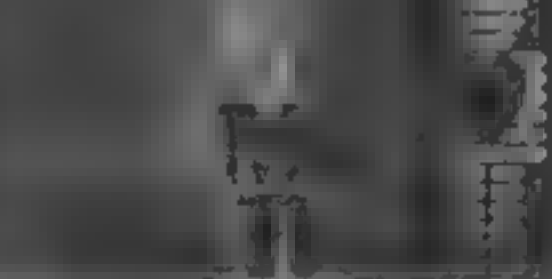


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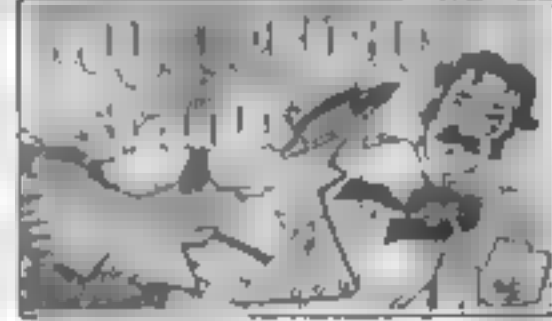
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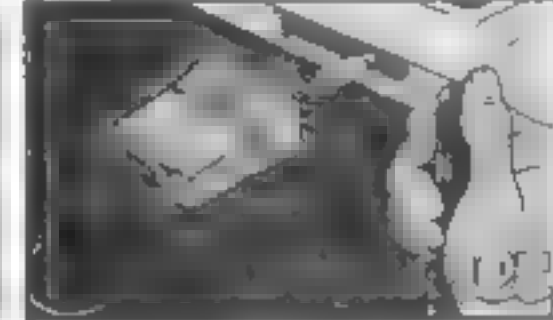
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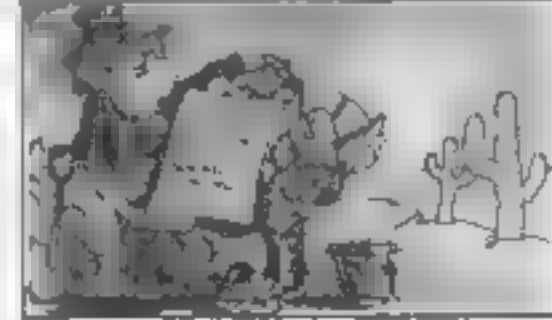
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Here's how to make a new resolution

Give your Commodore 64 programs that professional hires look by following Mike Roberts' guidelines

As you probably know high resolution graphics are possible on the Commodore 64. You may have seen them in commercial games, or at Commodore demonstrations

But the trouble is, the BASIC supplied with the 64 does not support this feature. In fact the truth of the matter is that the 64 can have six different modes of screen operation, five of which the operating system does not support. So you can't write programs in BASIC that have high resolution graphics.

The following subroutines will help in the writing of programs using the Commodore 64's highest resolution graphics mode, which gives 320 by 200 dots and 16 colours on the screen at once

On other computers, having 10K of screen would use up a lot of user memory. But the Commodore 64 has 64K of memory, and by using a page switching method the graphics screen will take up no user memory at all as it occupies the same memory space as BASIC.

Hi-res functions are called by subroutines that must be GOSUBed first via BASIC. Before a routine is called, however, some variables may need to be set. In fact many variables are used by these routines, and it is wise to avoid these as they may corrupt your program or crash the system. Here is a list of variables to avoid and their functions:

SC holds the memory location of the start of the hi-res screen in memory

CL holds the start address of the colour map in memory

QQ, QQ%, I, J, TC, GC, AB, YB, XX are all temporary variables in use throughout the routines

Subroutines

There now follows a list of the subroutines, the line numbers in the program listing where they occur, the variables that need to

be set upon entry to them, and how they work

Set graphics screen, line 100. This simply sets the screen into the graphics mode of operation

Set text mode, line 200. This sets the screen back into the mode that the 64 usually has in operation

Clear graphics screen, lines 300 to 399. This clears the graphics screen of all graphics and sets the background colour to that of the normal text mode i.e. memory location 53281

Copy text screen to graphics screen. This will transfer the contents of the text screen and dump it on the graphics screen. Lines 400 to 499. If CS is set to 1 then the copy will be made in lower case but if variable CS is 0 then the copy will be in upper case.

Plot point on graphics screen, lines 500 to 599. This will plot a point on the graphics screen at specified coordinates. Variables that need to be set on entry to this routine are as follows

FC Foreground Colour (a number from 0 to 15)

BC Background Colour (a number from 0 to 15)

RW Rubout or Write dot to screen. If RW = 1 then a dot is written, but if RW = 0 then a dot is erased

X X axis position of start of text 0 to 319 Origin is top left

Y Y axis position of start of text 0 to 199

Print text to graphics screen, lines 600 to 699. This will print the text string X\$ to the graphics screen. Other enhancements are available as the variables that need to be set will show.

X X axis coordinates in the range 0 to 319. Origin is top left

Y Y axis coordinate in the range string

FC Foreground Colour, a number between 0 and 15

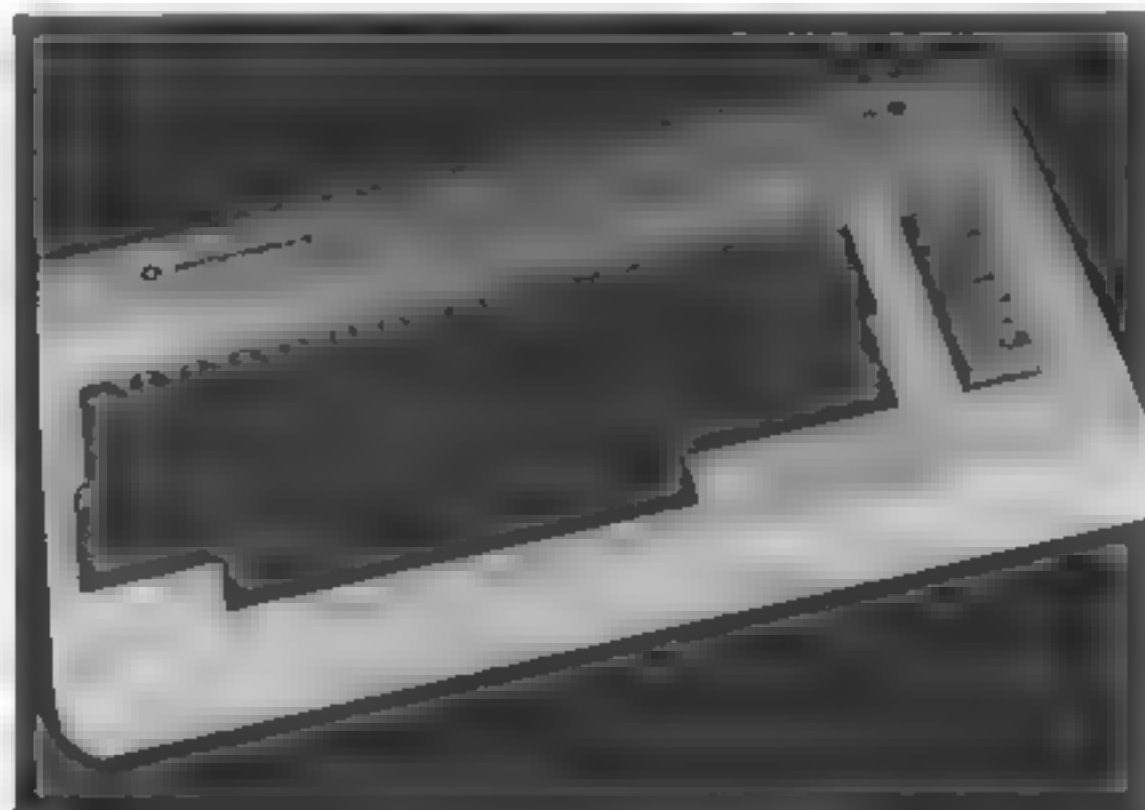
BC Background Colour, a number between 0 and 15

CS Case change. When CS is 1 then the string will be printed in lower case and when it is 0 the string will be printed in upper case

HG gives double height characters when set to 1 and normal characters when set to 0

UL% when set to 1 this will underline the text being printed

Machine code for page switch and plot, lines 700 to 770. This must be run before any use of the plot routine or the computer will crash. It only needs to be run once. The machine code starts at location 49152, but is totally relocatable



```

10 REM *****
20 REM
30 REM HI RESOLUTION GRAPHICS MODE
40 REM
50 REM ON THE COMMODORE 64
60 REM BY MIKE ROBERTS
70 REM *****
80 REM SET HIRES MODE
90 POKE$376,148:POKE$320,14:POKE$256,59:POKE$244,59:POKE$176,59:RETURN
100 REM SET TEXT MODE
101 POKE$53281,15:POKE$53280,15:POKE$53279,15:POKE$53278,15:RETURN
110 REM CLEAR GRAPHICS SCREEN
120 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
130 REM CLEAR GRAPHICS SCREEN
140 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
150 REM CLEAR GRAPHICS SCREEN
160 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
170 REM CLEAR GRAPHICS SCREEN
180 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
190 REM CLEAR GRAPHICS SCREEN
200 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
210 REM CLEAR GRAPHICS SCREEN
220 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
230 REM CLEAR GRAPHICS SCREEN
240 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
250 REM CLEAR GRAPHICS SCREEN
260 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
270 REM CLEAR GRAPHICS SCREEN
280 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
290 REM CLEAR GRAPHICS SCREEN
300 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
310 REM CLEAR GRAPHICS SCREEN
320 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
330 REM CLEAR GRAPHICS SCREEN
340 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
350 REM CLEAR GRAPHICS SCREEN
360 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
370 REM CLEAR GRAPHICS SCREEN
380 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
390 REM CLEAR GRAPHICS SCREEN
400 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
410 REM CLEAR GRAPHICS SCREEN
420 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
430 REM CLEAR GRAPHICS SCREEN
440 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
450 REM CLEAR GRAPHICS SCREEN
460 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
470 REM CLEAR GRAPHICS SCREEN
480 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
490 REM CLEAR GRAPHICS SCREEN
500 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
510 REM CLEAR GRAPHICS SCREEN
520 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
530 REM CLEAR GRAPHICS SCREEN
540 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
550 REM CLEAR GRAPHICS SCREEN
560 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
570 REM CLEAR GRAPHICS SCREEN
580 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
590 REM CLEAR GRAPHICS SCREEN
600 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
610 REM CLEAR GRAPHICS SCREEN
620 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
630 REM CLEAR GRAPHICS SCREEN
640 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
650 REM CLEAR GRAPHICS SCREEN
660 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
670 REM CLEAR GRAPHICS SCREEN
680 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
690 REM CLEAR GRAPHICS SCREEN
700 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
710 REM CLEAR GRAPHICS SCREEN
720 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
730 REM CLEAR GRAPHICS SCREEN
740 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
750 REM CLEAR GRAPHICS SCREEN
760 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
770 REM CLEAR GRAPHICS SCREEN
780 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
790 REM CLEAR GRAPHICS SCREEN
800 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
810 REM CLEAR GRAPHICS SCREEN
820 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
830 REM CLEAR GRAPHICS SCREEN
840 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
850 REM CLEAR GRAPHICS SCREEN
860 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
870 REM CLEAR GRAPHICS SCREEN
880 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
890 REM CLEAR GRAPHICS SCREEN
900 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
910 REM CLEAR GRAPHICS SCREEN
920 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
930 REM CLEAR GRAPHICS SCREEN
940 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
950 REM CLEAR GRAPHICS SCREEN
960 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
970 REM CLEAR GRAPHICS SCREEN
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3100 FOR I=0 TO 15:FOR J=0 TO 199:POKE I*200+J,0:POKE I*200+J,15:NEXT J:NEXT I:RETURN
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```


The world's first true 3D game.

Postern bring you the first fully
3 dimensional stereoscopic game.

by Mike Singleton

3D WAR

If you've escaped from the Snake Pit, survived The Siege, ridden the mighty Shadowfax and conquered the fearsome Firehawks see if you're ready for the ultimate experience.

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This game requires a colour television set
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SPECTRUM
VIC 20
COMMODORE 64
BBC 'B'

£7.95

Are you forever skimming through back issues of magazines trying to find an article or program that you know is around somewhere?

My magazine catalogue is designed to help you find exactly what you were looking for by giving the name of the magazine, date of issue, and page number of each article or program. It is possible to list entries from each magazine, or of each type

The program allows you to decide the magazines included and the categories to give you as wide a scope as possible

Find that magazine article the easy way

Forget the frustration of hunting out the article which you know has just what you want. Let Simon Edwards' program for the Spectrum do the searching for you

Variables

arrays
 a\$ contains 22 characters of information on each entry 1 code of category, 2-11 description, 12-13 magazine code, 14-15 day number of issue, 16-17 month number, 18-19 year, 20-22 page number
 m\$ names of each magazine
 c\$ names of each category
 simple variables
 b\$ has different functions, DIM-ensioned so it always has a length of 2
 no number of entries
 max maximum number of entries
 cat number of categories
 mag number of magazines
 n, f control variables

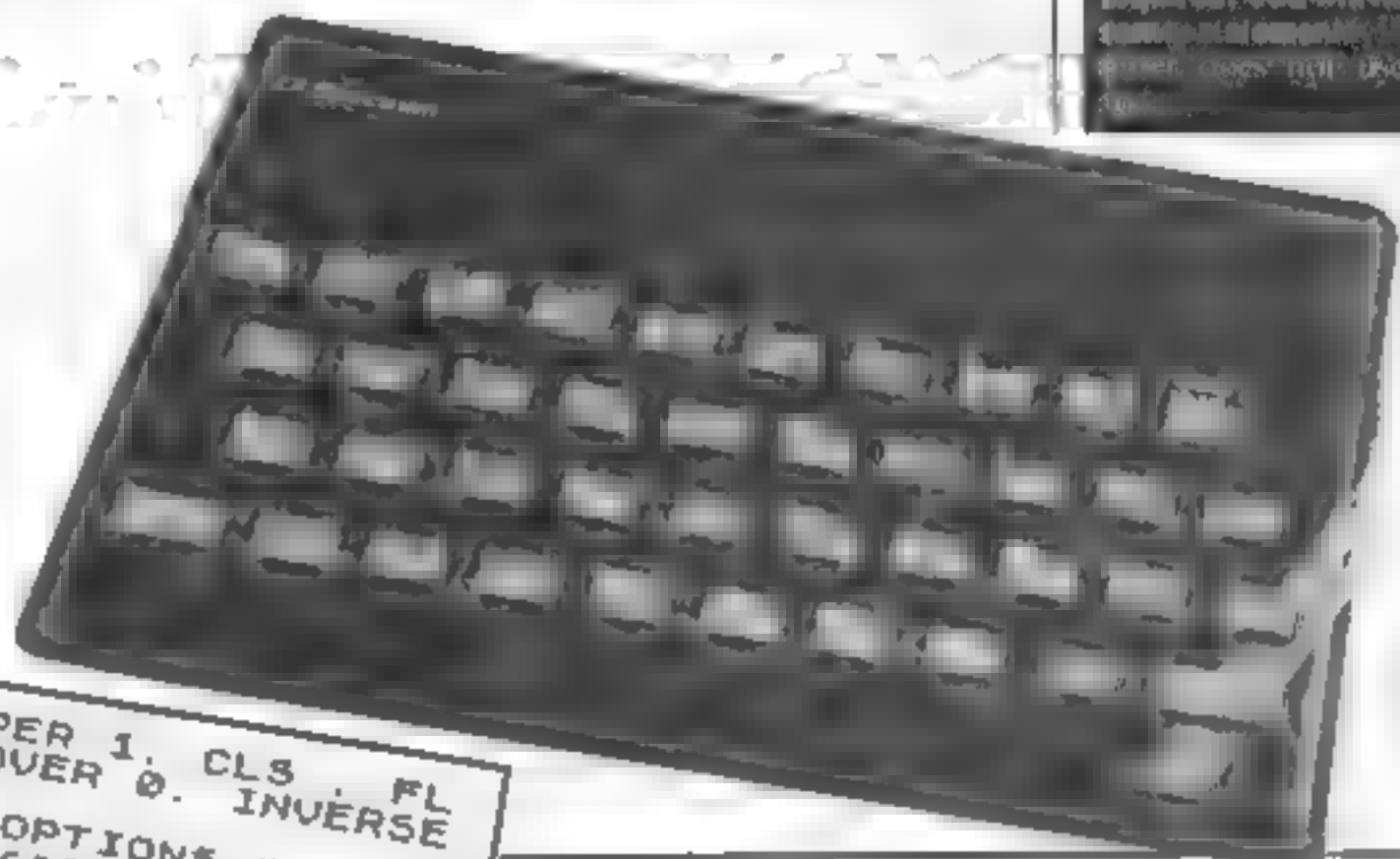
Hints on conversion

The program was converted from BASIC using a program which does a great deal with the program. It is not difficult to modify but a lot of work will be involved. You will have to modify some of the program's routines.

How it works

1-40 main loop
 100-190 sub-routines
 200-290 list categories
 300-390 list all entries
 400-490 list articles
 500-590 search routines

2100-2110 print information
 2110-2190 sub-routines for inputting data on entry: 2100-2140 category, 2200-2290 description, 2300-2390 magazine, 2400-2490 day of issue, 2500-2590 month of issue, 2600-2690 year of issue, 2700-2790 page number



```

1 BORDER 2 PAPER 1, CLS, FL
15H 0 BRIGHT 0, OVER 0, INVERSE
0 INK 7
0 CLS : PRINT "OPTIONS " "1-N
  entry " "2-View categories " "
  -Add entry " "4-View magazines
  -Save program and data"
20 LET b$=INKEY$: IF b$="1" OR
  b$="5" THEN GO TO 20
30 CLS : GO SUB (VAL b$+100)
40 GO TO 10
100 IF no>max THEN PRINT #0; "NO
  more room" : BEEP : 1,1: RETURN
110 LET no=no+1 : LET n=no : GO 5
  SUB 2100 : GO SUB 2200 : GO SUB 2300
120 RETURN : GO SUB 2400 : GO SUB 2500 : GO
  SUB 2600 : GO SUB 2700
130 FOR f=1 TO cat : PRINT f;TAB
  14, c$(f) : NEXT f
140 INPUT "Enter number to view
  entries " n : IF n=0 THEN RETURN
150 CLS : IF n>cat THEN GO TO 210
  PRINT f, a$(f, 1)=STR$ n THEN P
  RINT f, a$(f, 2 TO 11) : FOR f=1
  TO no : INPUT "Enter number for inf
  ormation " n : IF n=0 THEN RETURN
  IF n>no THEN GO TO 250
160 CLS : PRINT "Verifying " : VERIFY "
  Mag.Cat"
170 RETURN
180 REM initialization
190 CLS : INPUT "Max no. of ent
  
```

```

330 CLS : PRINT "Enter no. for
  amendment": GO SUB 2000: PRINT
  "0 to return"
340 LET b$=INKEY$: IF b$="0" TH
  EN RETURN
350 IF b$="1" OR b$="7" THEN GO
  TO 340
360 CLS : GO SUB 2000+(VAL b$+1
  00)
390 GO TO 330
400 FOR f=1 TO mag: PRINT f;TAB
  13; a$(f): NEXT f
410 INPUT "Enter number to view
  entries " n : IF n=0 THEN RETURN
420 IF VAL n>mag THEN GO TO 41
430 CLS : PRINT a$(VAL n): FO
  R f=1 TO no: IF a$(f, 12 TO 13)=f
  $ THEN PRINT f, a$(f, 2 TO 11)
440 NEXT f
450 INPUT "Enter number for inf
  ormation " n : IF n
  =0 THEN RETURN
460 IF n>no THEN GO TO 450
470 CLS : GO SUB 2000: PRINT #0
  ; "ANY KEY": PAUSE 0
490 RETURN
500 SAVE "Mag.Cat" LINE 1
510 PRINT "Verifying": VERIFY "
  Mag.Cat"
590 RETURN
999 REM initialization
1000 CLS : INPUT "Max no. of ent
  
```


SPECTRUM PROGRAM

```

1010 INPUT "How many different m
magazines? ";mag
1020 IF mag>99 THEN GO TO 1010
1030 DIM a$(mag,19): DIM f$(12)
1040 FOR f=1 TO mag
1050 INPUT "Name? (max 19 letter
s)" :TAB 12; a$(f)
1060 PRINT a$(f)
1070 NEXT f
1080 CLS : INPUT "Number of diff
erent categories? ",cat: IF cat>9
THEN GO TO 1080
1090 DIM c$(cat,18)
1100 FOR f=1 TO cat
1110 INPUT "Category? (max 18 le
tters)" :TAB 13,c$(f)
1120 PRINT c$(f): NEXT f
1130 LET no=0: GO TO 10

```



```

2000 PRINT "1-category",TAB 13,c
$(VAL a$(n,1)):"2-info",TAB 13,a
$(n,2 TO 11):"3-magazine",TAB 13
,a$(VAL a$(n,12 TO 13)):"4-day",
TAB 13;a$(n,14 TO 15):"5-month",
TAB 13;a$(n,16 TO 17):"6-year",T
AB 13;a$(n,18 TO 19):"7-page",TA
B 13,a$(n,20 TO 22)
2010 RETURN
2100 FOR f=1 TO cat: PRINT f;TAB
14;c$(f): NEXT f
2110 INPUT "Which category? ";f
IF f>cat THEN GO TO 2110
2120 LET a$(n,1)=STR$ f
2190 RETURN
2200 CLS : INPUT "Name or descri
ption?" :TAB 21;a$(n,2 TO 11)
2290 RETURN
2300 CLS : FOR f=1 TO mag: PRINT
f,TAB 13,a$(f): NEXT f
2310 INPUT "Which magazine? ";f
IF f>mag THEN GO TO 2310
2320 LET a$(n,12 TO 13)=STR$ f
2390 RETURN
2400 CLS : INPUT "Enter day no.
(0 if monthly) ";f: IF f>31 THEN
GO TO 2400
2410 LET a$(n,14 TO 15)=STR$ f
2490 RETURN
2500 INPUT "Month number? ";f: I
F f>12 THEN GO TO 2500
2510 LET a$(n,16 TO 17)=STR$ f
2590 RETURN
2600 INPUT "Enter year (e.g. 83)
";f$
2610 LET a$(n,18 TO 19)=f$
2690 RETURN
2700 INPUT "Page number? ";f: IF
f>99 THEN GO TO 2700
2710 LET a$(n,20 TO 22)=STR$ f
2790 RETURN

```

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Cinpac 108 Hermitage Woods Crescent St Johns Woking Surrey GU21 1UL

Excellent quality educational programs which cover tenses of verbs, nouns, verbs, adjectives and adverbs on English topics on side one and essays and maths addition plus a long division tutor on side two.

Accompanying the cassette was a little booklet with full explanations, instructions and information on how to alter the programs to meet your own requirements.

The purpose is to help reinforce subjects already taught - a drill exercise. Many a ready expert seems good, most awful! This is one of the best and there are four programs on the tape.

Well written, first class use of graphics and sound, user friendly, good motivation, a picture is built up on correct answers, enjoyable and well error trapped.

The format is the same for all four programs, a question is asked, an answer given, if correct the picture at the top is built up, if wrong another try is allowed, sometimes help is given and if still wrong, then the correct answer is given.

RF

instructions	100%
ease of use	90%
display	95%
value for money	100%



English Invaders VIC-20 £5.99

Rabbit Software 780 Station Road, Harrow, Middlesex HA1 2JH

One of the things that any child hates to be is a failure. This is a pseudo educational program which helps him or her to be just that.

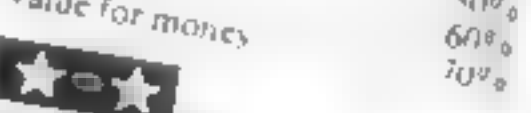
The basic idea behind the game is sound using a space invaders format with words taking the place of the aliens. The object is to shoot down the word by pressing the key corresponding to its grammatical definition (verb, noun, or adjective).

As the game proceeds the speed of descent of the words increases, giving you less time to decide which button is to be pressed.

If you fail to hit a word you lose a life (OK that's fair enough but the speed of the aliens increases if you miss giving progressively less time to react. This is hardly fair on a child who finds the game difficult. The game also needs a range of levels of difficulty to cater for children of differing abilities.

The list of words was limited to those of five or less letters and consisted of roughly 70 words (according to a quick peep with a machine code monitor). Several of the words were suspect as I doubt if the list was based on a standard key word list.

instructions	M.W.
ease of use	70%
display	50%
value for money	60%



Number Gulper BBC B £9.95

ASK, London House 68 Upper Richmond Road, London SW15

This program is well packaged in a presentation type case with a concise and simple, twelve page instruction booklet. Its stated aim is to supplement school work on number bonds in an interesting and exciting way, which means that the player must already have some ability in simple mental arithmetic with the four rules of number.

The recommended age range is from five to twelve, although it has proved interesting (and no doubt useful) to pupils up to six years.

The program has two sections, a test option or the game itself,

which can be played from the keyboard or by joystick. Two numbers are displayed at the top of the playing area in boxes. The lefthand number is the number you are trying to make the righthand number equal to.

Spread around the screen are numbers and signs (+, -, x, /, etc), and by guiding your gulper to these you change the righthand number accordingly. You have three lives and succeeding with at least two advances you to a higher level.

instructions	95%
ease of use	90%
display	82%
value for money	90%



Edutape 1 16K ZX81 £4.95

JRS 19 Wayside Avenue, Worthing Sussex BN13 3JU

Two educational programs on this tape, both aimed at children between five and seven and written by Gordon Askew, a deputy headmaster of a primary school.

The cassette insert contained the instructions and the aims - basically to develop visual and short term memory. This is an important skill and not to be neglected, as both literacy and numeracy depend on it. A picture early reader's exercise game.

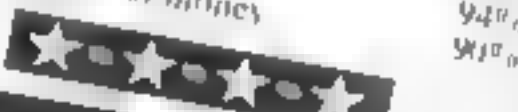
The tape was recorded by JRS's last load system and appreciated with care. ZX81s are not noted for ease of loading. My special 81's incompatible recorder failed, but a fairly old

one loaded with no problems several times.

Program one was a simple match pairs of hidden objects for two players or one player against the ZX81. Program two showed three teddies with food, the screen clears, then your match the teddy number to the food displayed.

Good, sound educational techniques and practice the program was simply itself to use with error trapped and entertaining.

instructions	RF
ease of use	90%
display	80%
value for money	90%



Snail Logo 48K Spectrum £9.95

CP Software, 17 Orchard Lane, Prestwood, Great Missenden, Bucks HP16 0NN

Logo is one of the excellent ideas that has to be used to be appreciated. It is a simple yet powerful language that can be used by very young children yet quickly teaches complex concepts like procedures and recursion as well as an understanding of mathematical and geometrical rules that underlie much graphical work.

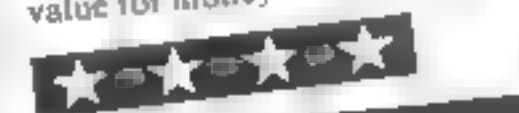
Snail Logo is a good implementation of the language, containing all the essential features. It comes with a small 26-page manual that explains everything in a comprehensive

way, though its organisation is a little confusing.

However, neither the manual nor the menu which drives the Snail Logo system could easily be understood by a child under the age of about ten or eleven, possibly even older, so as an educational tool the system is limited.

The other major fault of this system is that it is written in BASIC. Writing an interpreter for one language in another interpreted language which is itself rather slow produces some painfully slow programs.

instructions	M.W.
ease of use	90%
display	80%
value for money	75%



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Take your seat for the Oric picture show

If you've seen the Teletext transmissions, you will agree that they are an excellent way of putting a message across to the viewing public. Your home computer could be used in much the same way.

Microcomputer displays are being used in a few cases to advertise in shop windows, usually to sell the home computer on display.

But there is no reason why this form of advertising cannot be used to sell other products. Also, it could be used to advertise your club or society, or provide an extra special birthday card display for someone in the family.

Whatever application you may have, this article shows you how to produce, save, and display multicoloured pictures on the 48K Oric.

Pictures can be created on the Oric in TEXT mode simply by typing the characters from the keyboard outside a program. This is the method I use, although a short program is held in RAM to save your picture once created.

The save routine is part machine code. The hex loader for this machine code routine appears in figure 1.

Type in the listing, save it on tape, then RUN to put in the machine code. Then remove the hex loader with NEW, and type in the listing in figure 2.

You can store up to 26 pictures in the 48K Oric with this routine. Before starting to draw any picture, you must assign to it a number, to define its eventual storage position in RAM. Type RUN 500, and enter a number (1 to 26). On completion, the screen will clear, and the program will stop. At this stage you can start drawing your display.

First, set global INK and PAPER colours with direct commands, then clear the screen once more.

Move the cursor around the screen using the cursor control keys either side of the space bar, and type in characters as required. When you enter a character, it not only appears on the screen, but also goes into the input buffer. Once there are 80 characters in the input buffer, you will get a warning PING. Add two more characters, and the buffer will clear, and an automatic RETURN occurs.

This need be of no concern, except that you will need to remove the end of input marker by overtyping with space.

You can add attributes to the screen, at the cursor position, by pressing ESC, followed by one of the characters listed in appendix C of the handbook.

The convention is to enter a background colour attribute on the left most screen column, and

Use these routines and you could even create your own moving pictures. Oric advice from HCW regular David Nowotnik

Figure 1 — machine code hex loader

```

10 HIMEM #1500
20 X=#1500
30 REPEAT
40 READY
50 POKEX,Y
60 X=X+1
70 UNTIL Y=255
80 DATA#A9,#05,#85,#78,#A0,#00
90 DATA#B1,#79,#91,#7B,#C8,#D0
100 DATA#F9,#E6,#7A,#E6,#7C,#C6
110 DATA#78,#D0,#F1,#60,#FF
    
```

Figure 2 — screen save routine

```

10 PRINTCHR$(11);"  "
20 DOKE121,#BB80
30 DOKE123,DEEF(#400)
40 CALL#1500
50 CLS:WAIT200
60 DOKE121,DEEK(#400)
70 DOKE123,#BB80
80 CALL#1500:STOP
500 INPUTT
510 DOKE#400,#1E00+1280*(T-1)
520 CLS
    
```

Figure 3 — picture display routine

```

5 TEXT
10 FOR I=1 TO X
20 DOKE123.#BB80
30 DOKE121,#1600 280*(I-1)
40 CALL#1500
50 WAIT400
60 NEXT I
70 GOTO 10
    
```

the foreground attribute on column 0. Other attributes for colour, double height, flash, and alternative character set can be entered elsewhere on the screen — you will have to experiment with these to use them with effect.

In moving the cursor around the screen, make sure that you do not try to move it off the top or bottom of the screen, or the whole display will scroll.

Once you have completed your picture, take the cursor to the top left screen position, and press DEL for 20-30 seconds to make sure the input buffer is empty.

Then take the cursor down to a line in which the first three character positions are empty (but not the bottom line). Turn the cursor off by pressing simultaneously CTRL and Q. Enter RUN, and press RETURN, and the picture is saved in RAM. The screen will clear for a moment and your picture should reappear.

The machine code routine will instantly copy your picture from its position in RAM to the display file.

Repeat this procedure to draw the number of displays required, then remove the screen save routine with NEW. Enter the program lines in figure 3, substituting the letter x in line 10 with the number of pictures you have created.

Adjust the value of the WAIT command in line 50 to the delay required between the change in pictures. This routine will display your creations in numerical rotation, until you press CTRL C to stop it.

Before you use it save your machine code and displays and program — just in case.

First use (SAVE"DISPLAY",A-! 500,E=9800 to save your displays and machine code, then CSAVE"DISPLAY",AUTO to save the program. When reloading, lower the top of RAM with the direct command HIMEM=1500, then use CLOAD"" twice to load data and the program.

When the program is loaded, it should start automatically, paging your screen displays with your selected delay.

If you have nothing to advertise, or no birthday to celebrate, then you may care to experiment with the creation of moving pictures.

The machine code screen refresh is so fast it could be considered instant. So, with a short WAIT in line 50, the rapid turnover of images could create the effect of movement.

Are they really the same?

That's what these arcade lookalikes are supposed to be. Read on to find out whether our reviewers could tell the difference

Frogger 32K BBC £7.95

Superior Software, 69 Leeds Road, Bramhope, Leeds

I had trouble persuading the review copy to load its first block but won it to me eventually. Once loaded, the short but ample instructions were displayed and then off we went, hoppity, hop.

This is one of many Frogger programs on the market and comparisons, however odious, are bound to be made. The graphics are excellent: from the frog which actually hops to the open-jawed crocodiles and bull-or frog-doing lorries.

As the game progresses, the turtles start to dive, the wagons get longer and the vehicles move closer together. Flies and

crocodiles sometimes appear in the home caves and you get a bonus or lose a log if you land there depending upon the inhabitant at the time.

Two criticisms: there was no mandatory on all games new and there seemed to be a bit of a delay between pressing a key and the frog moving enough to make manoeuvring between tightly-spaced wagons difficult. Possibly a matter of personal preference or you may adapt to it.

instructions	100%
playability	70%
graphics	90%
value for money	75%



Crazy Kong Commodore 64 £7

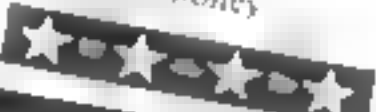
Interceptor Micro's, London House, The Green, Tadley

Crazy Kong is a fairly standard version of a popular arcade game. You must climb the ladders, collecting diamonds and jumping over various objects coming at you in order to get to the top of the screen.

Unfortunately there is a slight bug in the program when jumping over objects as you may lose a life even though you do not hit anything.

The keyboard controls are more of a hindrance than a help, so you need to be good at finger gymnastics to use them. I would recommend a good quality joystick for playing the game.

instructions	100%
playability	70%
graphics	80%
value for money	75%



Delta Tau 1 TRS-80 Models I & III, Genie I & II £10

Mohmer, 1 Buckhurst Road, Town Hall Sq., Bexhill-On-Sea, E. Sussex.

This game is similar to a number of arcade games — Galactic Invaders and Firebird to name but two.

You fight your way through sectors of space using a laser cannon which appears at the bottom of the screen. This has lateral movement controlled with the arrow keys and fires a laser cannon by hitting the space bar.

The invaders do not take on the orderly progression down the screen of earlier invader games,

but swoop at you in a haphazard way. The last three aliens in any screen take a very determined approach to destroying you.

The only further control you have over your ship is entering hyperwarp. This is achieved by pressing any of the numbered keys and this advances you to the next sector which contains more powerful aliens.

The graphics of this game are up to TRS-80 standard and the program has sound capability. A record of your score is shown as is the number of ships that you have remaining.

instructions	90%
playability	70%
graphics	60%
value for money	80%



Invaders Oric-1 £6.95

PSS 452 Money Stanton Road, Coventry CV6 5JX

Does the world need another version of Space Invaders? Evidently PSS thinks so, and has to be credited with an above average standard of graphics and variations.

The game itself has not been changed but PSS's machine code version provides excellent use of the Oric's sound, colour and graphics to warrant its comparatively high asking price.

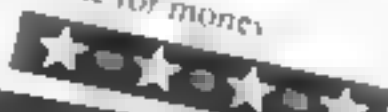
Apart from the option of a one or two player game, pressing the S key will turn the sound on or off, while H can be used as a pause button during a game if the phone rings or you just need a breather from the all-out action.

Each player starts with three lives and a 1000 points added on reaching 1500 points. Hitting the membership that crosses the top of the screen from left to right at random brings a mystery bonus.

Scoring is not easy as the aliens rain down bullets with the occasional extra speedy missile which catches you unaware and a 1000-point score is a notable achievement.

Loading Invaders into the Oric is a mere touch at fast speed, but this is due to the fact that PSS wisely provides a well recorded tape.

instructions	85%
playability	90%
graphics	90%
value for money	86%



Mini-Kong VIC-20 £5.95

Anrog Software, 8 High St, Horley, Surrey.

This is a version of the excellent Crazy Kong game available from the same company and cut down to run on the unexpanded VIC.

The quality of the graphics is identical to the full version. All you lose is some of the embellishments.

For example, due to the lack of RAM you are given only one screen. This does, however, incorporate an elevator to make life a little more interesting.

If you reach the top of Kong's refuge you start the screen over again — but with greater difficulty.

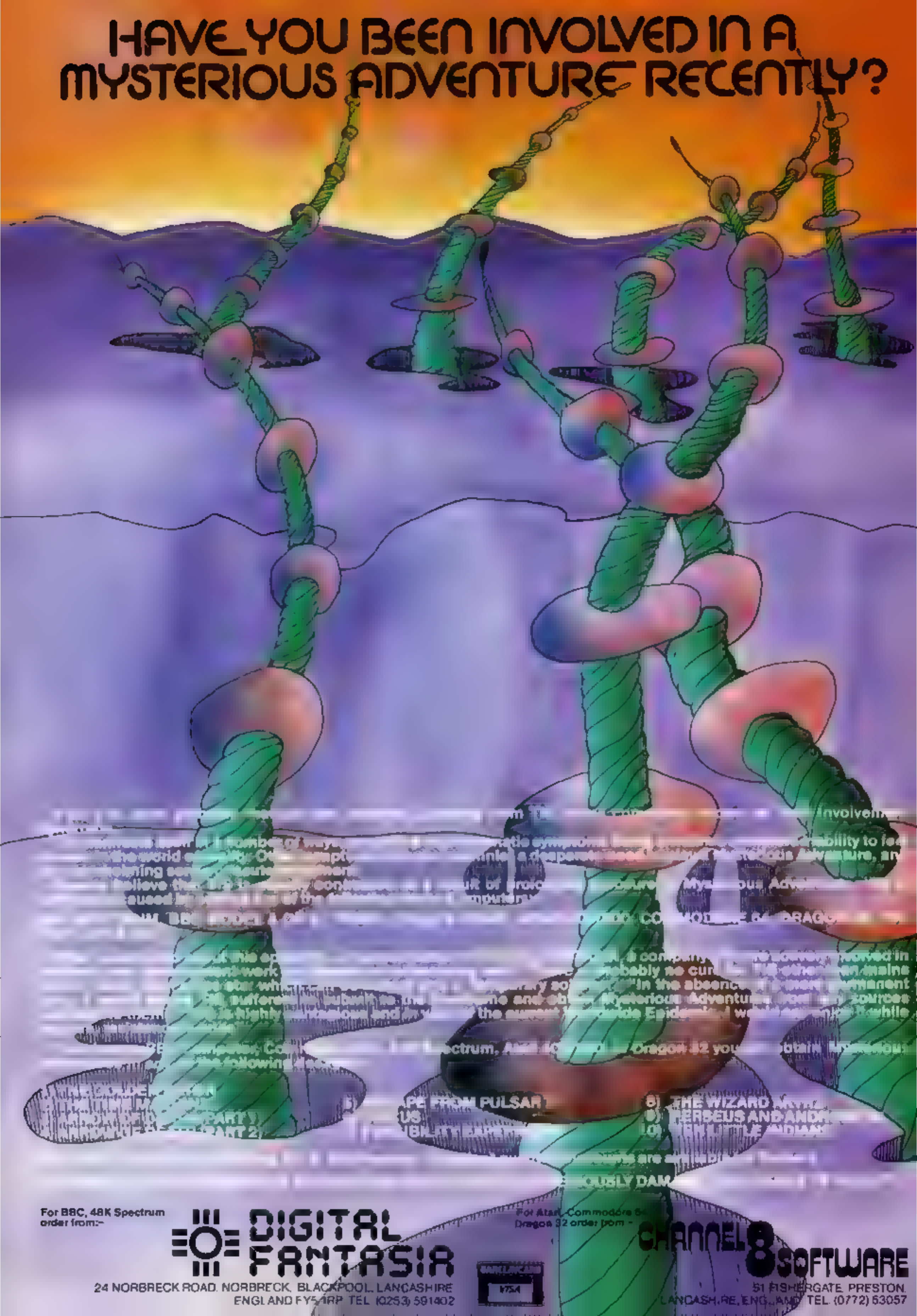
When I visited the recent Commodore show, I took the opportunity to check out similar games

by other companies. To be honest, both Mini-Kong and its big brother out classed them all. This is a well written, neatly presented game which represents good value for money.

instructions	70%
playability	85%
graphics	90%
value for money	90%



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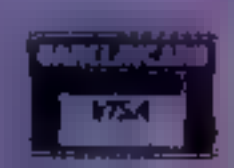
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Top Ten programs for the Dragon-32

- | | | |
|----|-------------------------|----------------|
| 1 | The Key | Microdeal (2) |
| 2 | Frogger | Microdeal (3) |
| 3 | Android Attack | Microdeal (4) |
| 4 | Space War | Microdeal (5) |
| 5 | Shuttle | Microdeal (7) |
| 6 | Night Flight | Salamander (6) |
| 7 | Planet Invasion | Microdeal (8) |
| 8 | Cuthbert Goes Walkabout | Microdeal (10) |
| 9 | Champions | Peaksoft (-) |
| 10 | Ring of Darkness | Wintersoft (9) |

Compiled by Boots. Figures in brackets are last week's positions

Top Ten programs for the ZX81

- | | | |
|----|-------------------|----------------|
| 1 | Space Raiders | Sinclair (1) |
| 2 | Espionage Island | Sinclair (2) |
| 3 | Flight Simulation | Sinclair (3) |
| 4 | Fantasy Games | Sinclair (4) |
| 4= | 1K Games | Sinclair (4) |
| 5 | Defender | Quicksilva (5) |
| 6 | Football Manager | Addictiva (7) |
| 7 | Scramble | Quicksilva (6) |
| 8 | Chess | Sinclair (-) |
| 9 | Ship of Doom | Sinclair (9) |
| 10 | History | Sinclair (10) |

Compiled by Boots. Figures in brackets are last week's positions

Top Ten programs for the VIC-20

- | | | |
|----|-----------------------|----------------|
| 1 | Arcadia | Imagine (1) |
| 2 | Skyhawk | Quicksilva (3) |
| 3 | Cosmic Crunch (cart.) | Commodore (4) |
| 4 | Wacky Waiters | Imagine (2) |
| 5 | Catcha Snatcha | Imagine (6) |
| 6 | Gridrunner | Llamasoft (-) |
| 7 | Cosmiads | Bug-Byte (7) |
| 8 | Panic | Bug-Byte (8) |
| 9 | Sargon II Chess | Commodore (5) |
| 10 | Frantic | Imagine (-) |

Compiled by Boots. Figures in brackets are last week's positions

Top Ten programs for the Spectrum

- | | | |
|----|------------------------|----------------------|
| 1 | Jet Pac | Ultimate (1) |
| 2 | Scrabble | Psion (-) |
| 3 | Flight Simulation | Psio (2) |
| 4 | Horace and the Spiders | Psion/M. House (3) |
| 5 | Transylvanian Tower | Richard Shepherd (8) |
| 6 | Horace Goes Skiing | Psion/M. House (7) |
| 7 | Football Manager | Addictiva (4) |
| 8 | The Hobbit | Melbourne House (6) |
| 9 | Ah Diddums | Imagine (10) |
| 10 | Pssst | Ultimate (-) |

Compiled by W. H. Smith. Figures in brackets are last week's positions

64 'to use software for Apples'

Interesting news for owners of the Commodore 64 — you will soon be able to run Apple software, says a Minneapolis company.

Advanced Integrated Development has announced the Amulator, a \$129 board to allow the 64 to use about 18,000 programs that have been developed for the Apple II.

To get the board to operate, you must remove the 6510 chip from the 64, plug it into the Amulator, then plug the Amulator into the 6510 socket. The board should be out soon. It will allow users to have two computers in one. The 64 will continue to operate normally, but will also be able to read programs developed for a 40-column Apple II. As a side benefit, the Commodore disc drive will also be able to read Apple discs.

The device is not without its limitations. Users will not be able to write to the disc in Apple emulation mode nor will the unit recognize more than one disc drive.

Furthermore, the software requiring an 80-column display will not run properly nor will it be able to take advantage of the extra features present in the new Apple IIe. The limitations occur mostly because the company does not wish to infringe on the design of the Apple II. Very noble in these days of limited ethics.

It would appear that this device may find its way into many classrooms and other applications where the cost of the Apple is prohibitive.



Home computer users — especially those with Tandys — will find it worthwhile writing for a catalog from these people: Computronics Inc., 50 North Pascack Road, Spring Valley, New York 10977, phone (914) 425-1535.

They offer very good prices, a 24-hour order line (so you can call during off hours for best rates), and a 30-day money-back guarantee on what they sell.

What they sell mostly is software and books, although they do have limited types of hardware. They also sell a number of programs and books for other popular computers including the VIC-20 and Commodore 64, the Atari, Apple, PET, and so forth. They will ship to the UK too, and will take all major credit cards.

Some of the software they offer seems very impressive. For example, the VersaBusiness Series. There are five separate packages in this series, four priced at \$99.95 and one at \$149.95. The first four cover receivables, payables, payroll, and inventory; the last is a complete ledger system. The series is designed to run with a set of low cost computer forms for your printer.

Backed up by their guarantee, they make the very simple statement that VersaLedger II will outperform any other competitive system. After seeing a detailed description, I think it definitely offers great value for money. Write to them for their well-produced catalog No. 12.



RAMAX is a neat add-on device for your VIC-20. It is a 27K unit that replaces a 16K RAM module, an 8K RAM module, and a 3K RAM module. It enables the use of two extension connectors that are quite similar to the VIC's memory expansion connector. Using this device, you can switch designated memory sections on or off, allowing you to use the device with any VIC plug-in peripheral.

Included in the package is 27K of RAM, the two extension connectors, a reset switch, a connector/memory safety fuse, and a diagnostic program. RAMAX costs about \$170. A smaller version, imaginatively called RAMAX JR., which holds 19K of RAM is available for about \$30 less. Contact Apropos Technology, 350 Lantana Avenue Suite 821, Camarillo CA 93010, (805) 482-3228 for more information.

That's it for this week
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Fairfield, California

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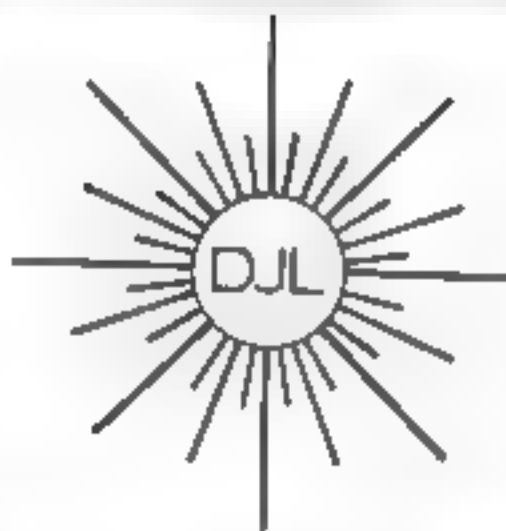
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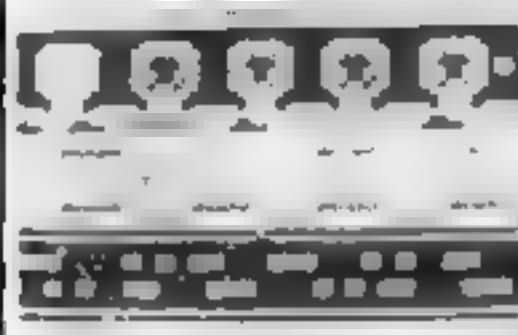
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Jericho 2 / Farmer Horace
48K Spectrum £4.80

Elephant Software, 41 Haymill Road, Burham, Berks SL1 6LF

Two programs for the price of one. Firstly forget any relation to Pison's Horace in Farmer Horace — this is a version of the old favourite Kingdoms, often found in listings form in magazines.

Essentially text, but with a nice display, this is as good a version of this frustratingly absorbing game as any. The aim is to juggle land/corn/population figures in

problems such as rats who eat

varying amounts of your precious corn.

Jericho 2 is a variation on Farmer Horace but much more complex. It's really almost a strategic battle simulation, text only, and based on Joshua's battle of Jericho — information the farmer has been forgotten!

This is an excellent program of its type, and if you enjoy these thoughtful exercises, you'll find many more hours slip by while you deploy your troops.

Sound and graphics are almost non-existent in these games.

R F

abstractness	85%
playability	90%
graphics	10%
value for money	90%



Software that's all in the mind

We rate a selection of programs designed to make you put on your thinking cap

Park of Death Dragon £5.95

NIK 1, 30 Painswick Road, Birmingham, B28 0HF

A maze game with a difference.

The maze never changes, and all you have to do is move using E N W S keys from one side to the other. Sounds easy, doesn't it? But it's not quite that simple. There are some nasty surprises in store.

For instance, there are 100 boxes and you must guess the number of the box containing the key within seven goes. Watch out though, some contain lethal objects — I was spared this particular fate.

There is also a homicidal robot who turns vicious if you can't tell him his name after it is shown briefly on the screen. This name

changes so you can't cheat.

The worst of the obstacles to my mind was the crusher where you are allowed 15 attempts to guess the correct letter of the alphabet before being crushed.

These are just a few of the obstacles you may meet on your journey across the park. I must confess that I never reached the other side despite numerous attempts.

The graphics are interesting and I had no difficulties in loading the game. Quite enjoyable but I think it would become monotonous after a while.

instructions	60%
playability	60%
graphics	75%
value for money	60%



TI-99/4A (Extended BASIC) £8

Lizard Games 14 Bridgewood Brookside, Telford, Shropshire, TF3 1LY

Torture — you'll take on a deeper understanding of the word once you've played this game.

Set in a maze, your objective is to reach the centre in no more than 100 moves and without losing the three lives you are allowed.

When the maze first appears on the screen, no fences or gateways are shown. These are only revealed as you make your way round and depend on which row or column you are in at the

To make this even more difficult skulls of previous explorers block your path. These are unfriendly and may be dealt with by various means which you have to discover for yourself, but as each method is more frequently used the less effective it becomes.

Direction of travel is controlled by the cursor keys. The distance, however, is determined by stopping a random number display with the ENTER key. Slow reactions here are not only a waste of time but agonising.

J W.

instructions	70%
playability	66%
graphics	60%
value for money	50%



Everest Dragon-32 £7.95

Salamander, 17 Norfolk Road, Brighton

The latest from Salamander is a little disappointing for the price. A simple plot: all you have to do is climb one of three mountains, using a team of six climbers in the least number of days.

At the start of the game you are invited to choose a particular mountain to climb and the supplies you wish to carry.

Having equipped your party you set off on the climb where various hazards befall you — crevasses, falls etc.

Throughout the game full reports are available on the state of your health, progress, supplies etc.

One criticism is that the input stage is rather long-winded.

Secondly, the game is in two parts. Text is used for the preparation, inputs and reports. Hi-res graphics are only used to the representation of the actual climb.

The lack of graphics and slow input let down what could have been a novel program. The instructions are first class, though, and easy to understand.

A G.

instructions	100%
playability	60%
graphics	20%
value for money	60%



Time Slip and Treasure Island VIC-20 + 16K £6.50

Griffin Software, 48 Rannoch Drive, Mansfield, Notts

In essence these are standard textual adventures. Time Slip dumps you in the remote past and you must do battle with prehistoric nasties during your attempts to return to the present. In Treasure Island you are dumped on an island. You must avoid the cannibals and find your way home.

The idea of such games is to manipulate objects and move your alter-ego by simple two word commands. These types of programs are often complex and

slow to respond. These programs, in spite of being written in BASIC, react quickly.

The big limitation is the lack of RAM in the VIC. This is reflected in the plot and complexity of the games. In spite of this, they are reasonably difficult and interesting.

I do have one moan. There are two ways of handling commands in adventure games. First, you can allow for all combinations of words in the vocabulary (the good way) or you simply cater for the combinations needed to solve the game (the not so good way).

instructions	85%
ease of use	80%
display	n/a
value for money	90%



It started with a kissometer

Mr Micro is not only the name of a company but also an apt name for its founder Jim Gregory. The foundation of the firm was laid while he was still at school.

Jim became interested in electronics, he says, "at a time when transistors were just becoming available". "We used to make such things as kissometers with all the attendant extra activities that entailed."

This led Jim into an apprenticeship in electronic engineering and a qualification to work on radar and defence systems. At about this time he discovered games, of the board variety, and soon became hooked.

Jim invented one called "Island Election" which, he says, "had thousands of rules and needed a million pieces to play it". Due to this complexity he never managed to sell the idea, and it was only later he realised that computers would be best for playing such games.

"At that time, computers were still a priesthood into which only the chosen were called. The ordinary man didn't realise how easy it was to use and program them," he recalls.

Jim's first program was written on a programmable calculator with only two stores, "just like having a two byte memory!" It was a rate relief program and the machine had no branch instructions and method of program storage at all.

"The operators had to key the program every time they used it. With early equipment like that, you learned to be very conservative in your programming. Now programmers who work for us have to try very hard to convince me that something cannot be done," Jim said.

"In July 1980, we decided to start a business aimed at the new home computing market. My wife Val would work full-time until it could support us both properly. All we needed then was a name.

"We tried all sorts, before one day, while reading a Mr Men book to my son, the name Mr Micro came to mind. It seemed to fit well so we used it and, as we have already had a couple of offers to buy the name, others must like it too."

The first product that Jim produced for a computer was a screen address programming aid for the Pet which sold thousands of copies and encouraged him to think more about the new computers and their use.

"The only games for the Pet at the time were of the bang-bang, shoot-shoot variety but I wanted to go into deeper mind-involving games," he said. "That's how we came to be programming for the VIC, we decided to try to have the

Electronics can be put to some strange uses, as Dave Carlos found when he talked to Jim Gregory — the man behind Mr Micro



Mr Micro himself — Jim Gregory

first all-British game for that machine and had to borrow a pre-release VIC from a friend in order to do so."

The game, Gold Rush, was to be a graphic adventure, one game leading to others and all providing clues to the final solution. It was released in June 1980 and by Christmas had sold over a thousand copies. In February '82 someone cracked version 1 but Gold Dust 2 is still selling well and the prize is still to be won.

This encouraged Jim and Val to go into the business full time, and so they started to look

around for the money to do so. Jim recalled, "In our walks around the high street banks we heard some amazing things. One told us that their predictions forecast the boom in home computing would die in Autumn 1982, another that they preferred to put their high-risk capital in non-risky enterprises, and yet another that they were not loaning in the north west of England as it 'is a depressed area'. Eventually we got what we needed, partially by mortgaging the house and kids but also from a helpful bank."

Mr Micro now has several facets. There is the retail shop below his office at 69 Parlington Lane, Swinton, Manchester, where I couldn't count the number of different micros, much less the quantity of programs they stock!

There is the program publishing side and a collaborative venture with another group to develop a superior software protection device. So far all the 'experts' have failed to beat the unique system. All Jim would say about it was, "No-one copies a car because it is simply too expensive to do and that is what will prevent people from cracking this device."

He also has plans to enter the educational market with a completely different approach. "One of the things that makes Britain great is the individuality the schools allow and that is also what makes the education market so difficult.

"Unlike other countries there is no common curriculum and therefore providing software becomes impossible. We intend to aim our software at the home, where a product must be attractive to be used, so our programs will aim first to be great fun so that learning is a by-product."

On the games side, Jim likes to get new ideas and concepts. "Mysterious Island" for example, is really 20 games in one, linked together by an adventure concept. Mr Micro provides a personalised certificate to any one who completes it and lets them know. "We are sad to some extent that arcade game copies are so much in demand as we would prefer to try to take games to a different level," said Jim.

But believing that the public is not yet ready for new games concepts, Mr Micro has just launched three new titles for all types of machines. Called Hunchy, Bengo and Humphrey, they are all fast action games.

Coming soon are dual program tapes, with a program for say a VIC 20 on one side and the same game for the Commodore 64 on the other. "This will be better for everyone," Jim reckons. "Buyers will be able to keep the tapes when they upgrade, and the dealer will only have to stock one tape for both machines. We also hope to do some dual BBC/Electron tapes."

Jim believes that the next technological breakthroughs will be in the areas of speech recognition and synthesis coupled to video disc. As a game player and designer, he sees Mr Micro staying in this type of leisure industry. Or as he prefers to put it, he expects to be involved in "mindventions" for some time yet.

MR. CHIP SOFTWARE

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If you're left-handed

I am a proud owner of VIC-20 and, after typing in the program in HCW 25 called Mine Sweeper by Stephen Saxon, I found the keys A and Z to be in a comfortable position as they are the first two keys on the left of the keyboard and I am left handed.

I asked my father to try the game. He enjoyed it and commented that if the keys on the extreme right of the keyboard were used it would be more comfortable for him as he is right handed.

So I put in additional lines so that you can use the A and Z keys or the K and M keys.

And here are those lines (_ means one space)

```
27 IF MS = "K" THEN
D=D-1
32 IF MS = "M" THEN
D=D+1
156 PRINT "[4 cursor up]"
158 GET AS: IF AS: IF AS
= " _ " THEN 60
162 PRINT "[SHIFT AND]"
IF _ YOU ARE
RIGHT _ HANDED"
163 PRINT "[RVSQ]"
K _ _ TO _ GO
UP
M _ _ TO _ GO
DOWN"
```

Jackie Hamilton
Dundonald, Belfast

Scrabble suggestions

This letter is for everyone who has bought Psion's Scrabble for the Spectrum.

This great program has many excellent features. But there are two options which the booklet supplied with it doesn't tell you about.

Pressing SYMBOL SHIFT and T lists all the tile values.

And pressing SYMBOL SHIFT and D displays the distribution of the tiles.

David Poole, Stevenage, Herts

Off-putting pin-ups

A few weeks ago your magazine had on the front page: "Girls: micros are for you, as well". Since then, you have had pin-up girls, half naked on your front pages. How can you expect us females to get into computing when magazines insist on putting such things on the covers and so putting us girls off?

Miss K D Yarwood
Hatfield, Herts

Send your letter to Letters, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE. Don't forget to name your computer — the best letter could win £5-worth of software. Queries cannot be answered on this page



Calendar adjustment

Alan Blundell's calendar program (HCW 21) is an excellent example of the string handling ability of the TI 99/4A home computer. However, there is one basic error in his program: the calculation of a leap year is not correct. My enclosed amendments put this error right.

A leap year is any year which is divisible by four, provided it is not divisible by 100, except when it is also divisible by 400. The calculation I have used to find the position of the start of the month string (lines 355 to 415 and 490) is based on a formula derived by the German mathematician C F Gauss. Line 430 gives the amended calculation to find a leap year.

Pope Gregory did design his calendar in 1582, as stated by Mr Blundell. However it was not until 1752 that the Gregorian Calendar was introduced in England. Lines 305 to 325 take care of this.

```
120 CALL CLEAR
125 INPUT "WHAT'S YOUR NAME PLEASE?" NS
305 IF Y>=1752 THEN 320
310 PRINT "PRE GREG"
ORIAN YEAR TRY AGAIN
315 GOTO 300
320 PRINT
325 INPUT "MONTH:(1 12)"
340 PRINT : "THANK YOU" &NS
355 A=Y
360 MO=M 2
365 IF MO>0 THEN 380
370 MO=MO+12
375 A=A 1
380 C=INT(A/100)
385 YR=A-(C*100)
390 X=INT((2*B*MO)+B+YR+INT(YR/4)+INT(C/4))(2*C)
395 FOR G=7 TO 56 STEP 7
400 IF X>0 THEN 415
405 X=X+G
410 NEXT G
415 F=X*(7*INT(X/7))
430 IF (M-2)*(Y/4=INT(Y/4))*(Y/100<>INT(Y/100))+(Y/400=INT(Y/400)) THEN 470
480 MS=SEGS(128 SPACES
```

```
1 F*4+21&MS
610 CALL NCHAR (24)
620 CALL VCHAR (13, 99 24)
630 CALL VCHAR (13)
```

The other amendments not already covered are only cosmetic but I, obviously, feel they add to the original program.
Donald Thomas,
Chatham, Kent

It's not a fluke...

Congratulations. Yours is the first magazine I have found to print a program that works — Mine Sweeper for the VIC-20 (HCW 25).

I was beginning to think I would never do it and the magazines had put mistakes in to upset the programs. I hope the above program was not a fluke as I intend buying your magazine from now on.

I must admit when I first saw your magazine I thought: "Yuk, what a cheapie." But when I got into it I found your magazine better than the rest as your printing is OK to read, no fussy bits and, the best part, the programs work and the price is down on the others by half.

Keep up the good work and thanks for keeping me interested.

J Havies
Brentford, Middx

Oric springs a surprise

Oric Products has sprung a surprise which has caused an error in two of my articles in Home Computing Weekly. These appeared in issues 14 and 25, and covered the topic of colour serial attributes on the Oric 1.

The original Oric hand book clearly states that the address of the display file in the 16K Oric is 32K below that of the 48K Oric. This was the information which I passed on to readers in my articles.

However, trying out a 16K Oric in my friendly local Dixons branch, I found that the address of the display file is identical to the 48K model.

All the examples I gave in my articles will work on both models of the Oric.
David Nowotnik

Twice Over

In my Forest Rallye program, (HCW 26), I have noticed that line 1030 to 1120 have been printed twice, which may confuse some readers. Perhaps you could publish a note to the effect that the second set of line numbers should be ignored.

Graham Baldwin

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Dragon £29.95
(cartridge)**

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This useful cartridge combines all the features of a monitor, an assembler and an editor for use in writing or learning to write machine code programs.

The cartridge is smaller than most and hardly rugged but performs its job very well.

It is supplied with very impressive documentation in the form of an 80 page manual which comprehensively explains all of MACE's features and many of the elements of the 6809 assembly language.

However, any beginner to assembly language programming

and indeed some old hands will need a full reference guide.

The cartridge is surprisingly simple to use and does save valuable time in preparing and writing a machine code program. I particularly liked the assembler which among other things has the ability to assemble without a listing to screen, printer, tape or memory.

It also comes up with text error messages — very helpful in detecting any coding errors, a feature I unfortunately need too often!

It would be impossible to detail all the functions of this versatile cartridge.

instructions	90%
ease of use	80%
display	n/a
value for money	85%



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the
language
barriers**

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do some straight talking to
your computer**

**M Coder
48K Spectrum
£9.95**

PSS, 452 Stoney Stanton Road
Covenry CV6 5DG

One of the few genuine compilers for the Spectrum, this program is loaded into the computer where it sits at address 60,000 onwards. Type in or load another program, call M Coder and hey presto, a machine code version of your program!

"Oh yes" you say, "you don't get something for nothing". Well, you do have to select your BASIC keywords carefully — a few don't operate and some perform differently with M Coder. You can only work in integers, have one dimensional numerical arrays and no string arrays. There are a few other limitations

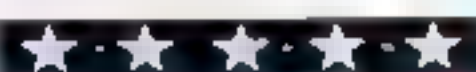
but nothing that a resourceful programmer can't get around.

Although comparatively inefficient (no dedicated code) a speed increase from 10 to 100 times the original can be obtained — a BASIC game I M Coded went from boring to unplayable and delays had to be introduced!

You can also compile and save code in parts, so a suite of M Code subroutines is feasible. The program instructions are supplied on a cassette and are concise, but expect the user to be familiar with BASIC.

I found the program easy to use and wonder how I got on without it.

instructions	90%
ease of use	90%
display	n/a
value for money	100%



**Toolkit
BBC B £8.95**

Logic Systems, 129 High Street,
Cherry Hinton, Cambridge

This program is essentially for machine code programmers and creates an additional 13 Basic commands to the BBC's already extensive system.

BREAK sets up a breakpoint in a machine code program.

BREAK? prints the current breakpoint address.

CHECK calculates a check sum between two given addresses.

DIS disassembles code between two addresses into 6502 mnemonics.

FIND finds all locations, between given addresses, of a number of text string.

HEX prints a Hex dump between given addresses.

MOVE moves code; useful for

altering code for DISC/TAPE systems or data blocks.

MEM stores bytes, similar to ? and \$ operators.

RELOC similar to move, except code addresses are altered to allow it to run at the new address.

SHUT turns off the toolkit.

STEP steps through a m/c program displaying information.

TOOL displays toolkit commands.

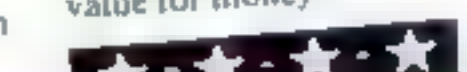
XEQ runs a m/c program.

The program occupies memory from &7100 to &7C00.

An accompanying booklet explains how to use this clearly and simply.

R.E.

instructions	92%
ease of use	90%
display	90%
value for money	80%



**Monitor &
Disassembler
48K Oric-1
£4.95 each**

Pavesoft, 213-215 Market Street
Hyde, Cheshire SK1 1HH

These two programs come as separate cassettes but their application is so similar that I shall review them together.

The Monitor is a straightforward and rather uninspiring program which offered me an impressive looking menu of options.

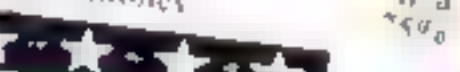
On closer inspection, however, I found that 75% of these options were either of very limited use or merely implemented existing keyboard commands (such as CALL).

These are minor problems though and the program does

allow you to look at, fiddle about with and move around chunks of memory in an efficient and workmanlike manner. The memory display is particularly impressive, and should prove helpful to anyone unused to poking around in the Oric's memory.

There is not much you can say about disassemblers, they either do it or they don't. This one definitely does and it does it very nicely. You input the start address and it chops out pages of 6502 mnemonics which you scroll through. One gripe however is that the start address must be in decimal notation exclusively.

instructions	C.P.
ease of use	70%
display	80%
value for money	n/a



**Forth FP50
48K Spectrum
£14.95**

Hampson & Lord Software, 7
Hereford Drive, Clitheroe,
Lancs. B87 1JP

A program which turns your Spectrum into a computer which you program in Forth instead of BASIC.

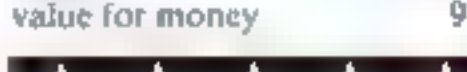
Forth is a high level language which needs a logical approach based on creating "subroutines" in the form of a dictionary of "words" and using a stack of numbers. Many claim that it is easier to learn Forth than BASIC. I had no previous experience, but had a set of "invaders" up and invading 1½ hours after loading this program.

Technically this is a BASIC program which compiles entries

into Forth format. It will process both integer and floating point decimal — numbers and will handle all Forth-79 structures plus special Spectrum commands, for colour sound and LDGs.

A 12-page typed, A4 booklet/manual is supplied, which I found simple to understand and which contained very short, one line, demos. It's a good introduction, but I needed a book to really get to grips with the language's capabilities. A few more demo programs with visual effects would have been nice.

instructions	86%
ease of use	99%
display	90%
value for money	97%



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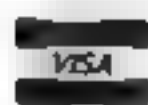
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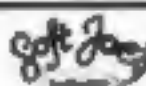
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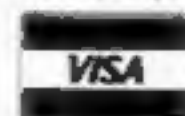
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